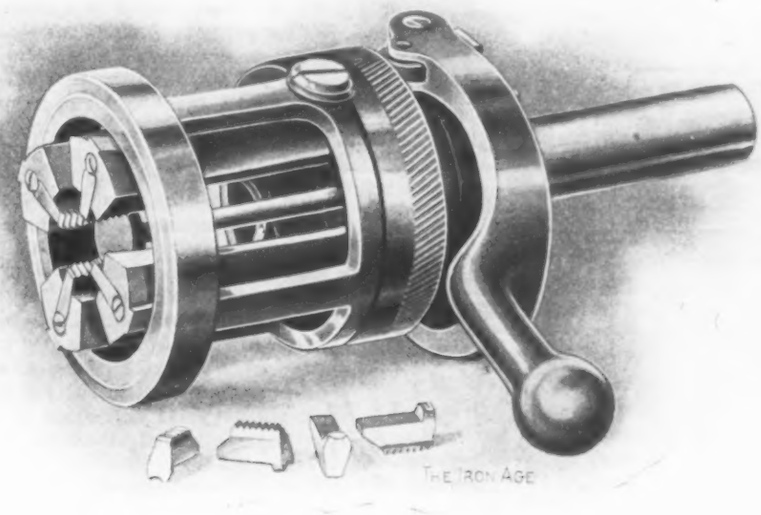
THE IRON AGE

THURSDAY, OCTOBER 16, 1902.

The S. & S. Screw Cutting Die.

The new self opening and adjustable screw cutting die designed and built by Scott & Sons Company, 173 High street, Boston, is for use on turret lathes and screw machines on which the turret is moved by hand. It is extremely simple in construction, positive in its action and absolutely nonclogging. It can be quickly adjusted to increase or decrease the diameter of the thread cut, and long or short threads, either right or left hand, can be cut clear up to a shoulder, if desired, by setting the gauge for the length required. When the gauge moves the die opens instantly and automatically.

The cutters are held by screws in the ends of four arms, B, which are cut from a solid piece of steel. The outer portion of the end of each arm is inclined toward the body of the tool, as shown in the section, Fig. 3. Surrounding these arms is an open cage, A, having a beveled part to fit the bevel on the arms. This cage is moved forward, to the left in Figs. 1 and 2, by means



Die Closed.

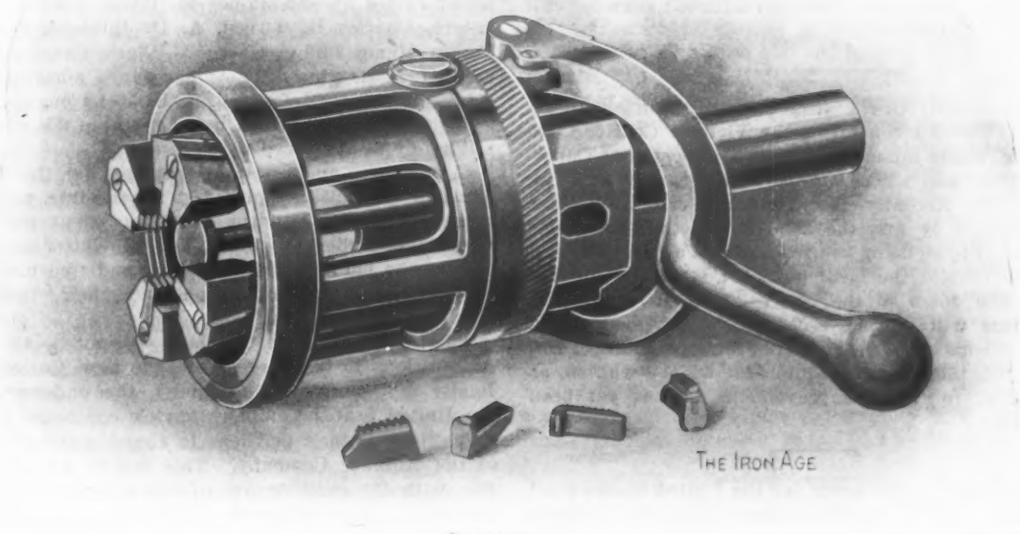


Fig. 2.—Die Open.

THE S. & S. SCREW CUTTING DIE.

of a handled yoke. This forward motion of the cage, by reason of the beveled surfaces, brings the cutters B toward each other and in working position, where they are held by the locking pin E engaging the yoke.

The gauge governing the length of the thread cut is clearly shown in the two half-tones and the sectional drawing. When the end of the gauge strikes the end of the piece being threaded it is moved in toward the shank D and withdraws the pin E, thereby releasing the yoke. The arms B now act as springs against the beveled surface of the cage, which is forced backward. This action springs the cutters entirely clear of the thread just cut, when the tool may be backed off without any danger of marring the thread on either the work or chasers. The cage can be adjusted so that the beveled surfaces will occupy any desired position in relation to each other and thereby vary the diameter of the thread cut. The chasers can be removed easily when they require sharpening and different sizes and styles of chasers can be used in the same head.

These dies are made in several different sizes for cutting straight or taper threads.

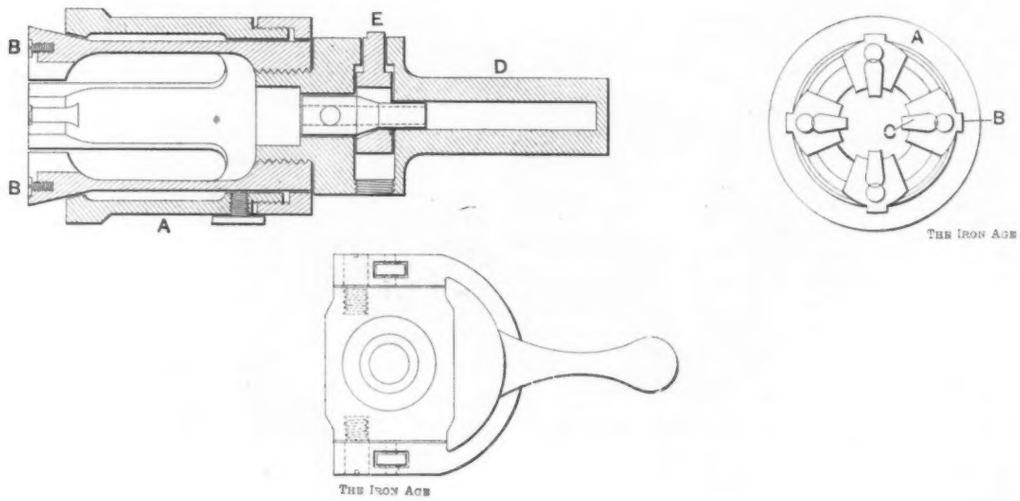


Fig. 3.—Details of Die.

THE S. & S. SCREW CUTTING DIE.

The Allegheny Ore & Iron Company, Clifton Forge, Va., have secured control of the Victoria Coal & Coke Company, whose mines and works are located at Caperton, W. Va., and whose offices were formerly at Catasauqua, Pa. Recently the Victoria Company's plant was damaged by fire, the head house, the blacksmith shop and tipple being burned. They advise us that they will rebuild the head house of steel and build a new incline down to the river. About 150 additional coke ovens will also be erected. No new machinery, except perhaps some new sheaves for rope haulage, will be required, though other equipment will be wanted, as no material for these improvements has as yet been purchased.

A. E. Hearper, fuel agent for the United States Steel Corporation, was in Pittsburgh last week. Mr. Hearper had just returned from a trip to the Texas oil fields, where he had been investigating fuel oil with a view of using oil as a fuel in the Atlantic Coast plants. There had been a report that the oil fields of Texas were giving out and that it was only a matter of a short time before the field would be of small value. Mr. Hearper found the report to be entirely untrue, and says that there is more in the Beaumont field than ever before. Mr. Hearper said that Beaumont had been changed from a typical lumber town to an oil town.

United States Realty Organization.

The permanent organization of the United States Realty & Construction Company was effected October 7 at a meeting of the Board of Directors, held at 135 Broadway, New York.

The following officers were elected: President, Bradish Johnson; chairman of the board, H. S. Black; vice-presidents: Albert Flake, Robert E. Dowling and S. P. McConnell; secretary, R. G. Babbage.

The Executive Committee will have the following members: James Stillman, chairman; Charles M. Schwab,, Albert Flake, Robert E. Dowling, H. S. Black, Hugh J. Grant and Henry Morgenthau.

The Board of Directors, as announced, includes only three names that were not mentioned in the provisional list made public several weeks ago—namely, John W. Gates, Cornelius Vanderbilt and P. A. Valentine of Chicago. In addition to these memebrs and those forming the Executive Committee, the board is made up as follows: James Speyer, James H. Hyde, William H. McIntyre, Charles H. Tweed, A. D. Juilliard, George C. Haven. Henry Budge, George C. Clark, Charles F. Hoffman, H. L. Higginson, B. Aymar Sands, Charles Francis Adams, 2d, S. P. McConnell, K. K. McLaren.

This gives the board a membership of 25, which will ultimately be increased to 30.

A treasurer and assistant treasurer for the new corporation were also appointed at the meeting, the former being Byron M. Fellows, who was treasurer of the George A. Fuller Company, and the latter Morris B. Mead, who has acted as secretary and treasurer of the New York Realty Corporation since their organization about a year and a half ago.

The Alliance Realty Company will not be among the corporations to be merged into the new United States Realty & Construction Company, the underwriters of the United States Company having concluded to avail themselves of their privilege to abandon the absorption of the Alliance Company. This will in no way interfere with the carrying out of the merger of the other companies, the George A. Fuller Company, the New York Realty Corporation and the real estate interests of the Central Realty, Bond & Trust Company. The original plans will be followed, except that as indicated in the announcement issued Tuesday the $2,500,000 preferred and the $2,500,000 common stock, which was to have been given in payment for the Alliance Company, will remain in the treasury of the United States Company. This will reduce the amount of preferred stock to be issued to $27,500,000 and the common stock to $33,500,000.

The Antwerp Iron and Steel Works.

From an electrical point of view possibly the most interesting iron and steel plant in the world to-day is the one in course of erection on the banks of the Scheldt, on the Hoboken plains, near Antwerp, Belgium. When completed this works will comprise a blast furnace plant, a steel works with a complete roll train outfit, iron and steel foundry, workshops, boiler and power houses, blacksmith shop, &c. The work is being rushed and the entire plant will be finished and in operation in a short time. Part of it is in operation now.

When the plant is in full swing it will require 4200 tons of iron ore, 1050 tons of limestone, 2100 tons of coke and 3000 tons of coal every 24 hours, the manipulation of which will be done almost entirely by mechanical means. The coke works with recovery of by-products is supplied with a washery and coal mixing plant. In addition there will be a plant for transforming the refuse from the washers into briquettes. A cement factory, with a daily output of 100 tons, will convert the blast furnace slag into building or paving stones.

A tube works with an output of from 40,000 to 60,000 tons of tubes annually, varying from 1½ to 40 inches in diameter, is also included in the plant. The steel works proper will produce 1200 tons of basic open hearth steel per day, which will be melted in tilting furnaces especially adapted for receiving the pig iron direct from the blast furnaces. The scrap will be melted down in four furnaces with a capacity of 20 tons. The rolling mills will consist of two divisions: In the one girders, rails, angles, rounds, bars, &c., will be produced; in the other, plates and sheets of the customary lengths, widths and thicknesses will be rolled. Electric drive is used throughout all the various shops, the energy being obtained from a well appointed power house centrally located.

This power house is essentially Westinghouse in all its appointments, and it will eventually have a capacity of 30,000 horse-power. The present plant consists of steam driven generators. There are two main sets, consisting of triple expansion marine engines direct connected to Westinghouse alternators. The engines are of 1500 horse-power capacity each, with cylinders 22, 32 and 46 inches in diameter. They were originally installed on an English torpedo boat, but have been reconstructed and provided with Sisson speed regulators. Each engine is provided with surface condensation, having a centrifugal pump for the water circulation. The condensation water returns to the boilers. The two main generators are three-phase machines of 900 kw. capacity, each operating at 6000 alternations, 2200 volts and 187 revolutions per minute. They are of the rotating field type. A third main generating set is also in use, but this has only been put down temporarily pending the completion of a part of the proposed gas driven installation. This set consists of a belt driven 400-kw. three-phase Westinghouse alternator of the rotating armature type, generating an electromotive force of 2200 volts at 6000 alternations. This machine will eventually be driven by an 800 horse-power compound tandem engine. The exciting plant consists of two 25-k.w. direct coupled sets, each being a 58 horse-power Westinghouse compound engine with a 220-volt Westinghouse direct current multipolar generator built on an extension of the engine shaft. The engines run at 350 revolutions per minute.

The central station switchboard connections are arranged for running the alternators in parallel, but two sets of high tension bus bars are provided, the object being to isolate the generator supplying the rolling mills from the other generators, which would be engaged in furnishing energy for general distribution. This switchboard at present contains six panels—one for controlling the two 25-kw. exciters, two for controlling the two 900-kw. alternators, one for the rolling mill circuit, one for the boiler works, foundry and repair shop circuit, and one for controlling the lighting circuit. All the switchboard apparatus is of the standard Westinghouse type.

There are four transformer substations located in the works, each designed with reference to the circuits they are intended to operate. Station No. 1 is located at the entrance of the central station and furnishes current for the complete illumination of the steel works, and at the present time also furnishes current for all the motors in the central station. The steel works are illuminated by 200 Körting arc lamps and 500 incandescent lamps.

The most interesting feature connected with the electrical equipment of this plant is the installation of three large Westinghouse variable speed, type "F" polyphase induction motors for operating the blooming and finishing mills. Necessarily the fly wheel capacity is large enough to overcome the inertia effects due to the sudden changes of load from minimum to maximum and *vice versa*.

The motors are controlled by railway type controllers, having a primary 2150-volt main and reversing switch, and three drums for varying the resistances of the secondary circuit. The resistances are of iron and give 15 steps in each phase. The speed variation gained by this means allows of a reduction of from 22 per cent. to 25 per cent. below normal speed, the normal full load torque being maintained over this range.

One of these motors is a 325 horse-power Westinghouse polyphase induction motor operating at 2150 volts and 600 alternations at a rated speed of 300 revolutions per minute. This motor is belt connected to a 24-inch two-stand blooming mill, which runs at a speed of 70 revolutions per minute and has a fly wheel of about 30 tons weight. In one stand 880-pound blooms are reduced from 10 inches square to 3¼ inches square; in the other stand 450-pound blooms are reduced from 7¼ inches square to 2¾ inches square section.

Behind the blooming mill are two finishing mills. Each finishing mill is supplied from one stand of the blooming mill. These mills are direct driven by Westinghouse type "F" polyphase induction motors, the motors being coupled by rigid flange couplings to the short fly wheel shafts of the mills, each mill having a fly wheel of about 12 tons in weight. The larger finishing mill is a 14-inch five-stand mill and is driven by a 450 horse-power motor operating at 2150 volts and 6000 alternations; the other, a 10½-inch five-stand mill, is driven by a 325 horse-power motor operating at 2150 volts and 6000 alternations. It will be noted that the three large motors are operated at full line pressure, no transformers being used. Very high speeds have been chosen for all the cranes. At times the traveling speed is 330 feet per minute and the lifting speed 50 feet per minute. All lifting, turning and traveling drives are equipped with automatic, electromagnetic safety brakes.

Thus far it has not been possible to determine the exact amount of power required to roll the different sections of iron, as simply tightening the rolling train doubles or even trebles the power necessary to roll similar sections. It has been ascertained, however, that the 325 horse-power motor belted to the blooming mill runs continuously at 35 to 45 amperes, and the 325 horse-power motor directly coupled to the finishing mill consumes on an average from 60 to 80 amperes. The 450 horse-power motor directly coupled to the finishing mills consumes on an average from 90 to 100 amperes. These motors have been running the roll trains for some time and the results are highly satisfactory to the installing and operating engineers, as well as to the proprietors.

The New York State Bankers' Association, who held their annual meeting in New York last week, referred to their Committee on Administration, with power to act, a resolution asking for a repeal of the national bankruptcy law. The resolution states that the present bankruptcy law was passed for the purpose of relieving the financial embarrassments of persons engaged in worthy business enterprises and to enable them to again engage in such business pursuits, and that, as sufficient time had elapsed for the accomplishment of that purpose, to continue the law longer in force would induce extravagant living and reckless speculation and encourage fraud and dishonesty.

How the Union Limits Output.

The National Metal Trades Association on September 12 sent out a circular letter to employers generally, asking for information within their knowledge as to the restriction of the output of their establishment. As a specimen of innumerable letters received the *Bulletin* of the association publishes the following letter from the York Mfg. Company of York, Pa.:

YORK, PA., September 23, 1902.

National Metal Trades Association, Cincinnati, Ohio:

GENTLEMEN: Your circular letter No. 143 received, and note what you say about the facts you are endeavoring to collect concerning the methods pursued by union labor in regard to limiting the output of establishments where such labor is employed. We herein state to you the following facts concerning our experience in this respect with union labor:

The business we are engaged in is the manufacture of ice making and refrigerating machinery, and the number of men employed in our works runs from 600 to 750. In 1897 this company determined to thoroughly equip and organize their works so that the machinery manufactured therein could be produced at a minimum cost. In carrying out this decision we came in contact with the union labor question, as follows:

Machine Department.

Upon receiving a report from our cost keeping department as to the time required by the men in performing the different operations on the machinery manufactured by us, we found that there was a great difference in the time consumed in doing the same work by the different men and tools, and we proceeded to rectify same by the introduction of new tools where the tools were at fault, and made an attempt to bring the men as near as possible to a uniform time on the same class of work.

We soon found that our actions in this direction were being discussed in the meetings of the machinists' union and that the members of the union were comparing notes and were setting the number of hours required to do the work, and the men that were doing the work in the least number of hours were instructed to increase the hours; it being claimed that if they did not they were working against themselves and their fellow workmen. All efforts on our part to equalize or control the output were objected to on the part of the union men, and our offers of a premium for better speed on the work were rejected. The nonunion men, however, were willing to give an honest day's work and co-operate with us in our efforts to find out whether or not it was the men or the tools that were at fault.

We then began putting in new and improved tools and the union men attempted to keep down the product of these tools to, or near about, what the old tools could do. The tools being new, and we not having any record of what they were capable of doing, they succeeded in keeping the number of hours way below what we have since found they could do.

In the spring of 1898 we bought several tapping and drilling machines. These machines are made by Baker Bros. of Toledo, Ohio. We set them up in our works and put a man to operate each machine. These machines are built with two spindles, each spindle being driven by a separate driving mechanism. As soon as we set these machines to work the union decided that we must put a man at each spindle, and their members refused to operate the machines unless we would do so. We thereupon put laborers upon the machines. The union men, however, made it so uncomfortable for these men that they could not hold their job, and we were finally obliged to put apprentices on the machines, one at each spindle. To do this we were obliged to put on more apprentices. Upon doing this the question of more apprentices was brought to our attention and we were informed that we were putting on more apprentices than the union allowed. This, however, we paid no attention to.

About this time we put in an eight-spindle drill, made by Bausch & Harris of Springfield, Mass. This drill has eight spindles arranged in circular form, which are driven by one series of mechanism, and therefore the objection which had been raised against the Baker Bros. drills, which was that each spindle constitutes a drill, could not be brought up in connection with this tool. The union machinists, however, decided to boycott the tool, claiming that it was detrimental to the interest of labor, and none of their members would operate it. They also interfered with and harassed the nonunion men whom we put to operate the tools, so that it was almost impossible for us to keep the same manned.

Another method of restricting the output, and one which caused us considerable trouble, was the interference of the union men with any of the men who would attempt to prepare a piece of work for his tool while same was in operation on another. If a man was noticed doing this he would immediately be visited by one after another of the union shop committee, who would, as they passed him, object to his doing this, and as soon as they got him where they could talk to him they would argue that he was doing two men's work and cheating another man out of a job; that as long as his tool was in operation he had a right to sit down until the job he was working on was finished before making any attempt whatever to prepare another piece of work, claiming that this was the same as operating two tools. In this way they would browbeat and interfere with the men who were willing to do all they could for the interest of the company.

The Baker Bros. and the Bausch & Harris drills we found to be very essential in the manufacture of certain parts of our machinery, and to get over the trouble which the union caused us in the operation of these machines we were obliged to buy a property and build a separate shop to put these tools in. In this shop we hired no machinists at all, but used only laborers and broke them in to operate the machines. The shop being at the opposite end of the works from the machine shops prevented any interference by the machinists.

This state of affairs continued until the fall of 1900 and the spring of 1901, when we found that the men were doing less and less work. In hunting up the reason for this we discovered that the feeds on the different machines were being slowed down, and on watching the men we found that a man by the name of M. F. Flynn, who was a new man with us, was going around from machine to machine and instructing and assisting the men to change the feeds to a schedule that he set. When we were satisfied that he was doing this we immediately took him to task about it, whereupon he quit, and announced himself as national representative of the machinists' union and took charge of the machinists in this city. A few days after leaving us he called in our office and made a demand on us on behalf of the union men, threatening that if such demand was not granted the union men would go on a strike. It being impossible for us to grant the demands of the union men, they did go on a strike on May 20, 1901.

After they had left the shop we found that they had destroyed, hid and stolen a great number of the special jigs and appliances that we had to facilitate the work. We also found that a number of the tools had been tampered with, especially the larger ones, which were in such shape that had we not looked them over carefully we would surely have destroyed them. We were fortunate enough, however, to discover one of the tools in bad shape, which made us suspicious, whereupon we went over all of them before starting up, and in this way discovered those that had been tampered with before any damage was done. We then remanned the tools with nonunion men and were very much astonished to find what a vast increase of output we were able to get. It was then that we discovered a number of things that had mystified us before the strike took place.

Foundry Department.

In our foundry department we had a great deal of trouble with the union men, and they interfered with and did everything they could to retard the work. This was particularly noticeable on bench work where a

certain number of flasks was decided upon by the union as being a day's work. They would put up just that many and no more.

The union molders struck one week after the machinists, whereupon we decided to put new men in our foundry, and we found that we could get out a great deal more with the new, inexperienced men than we could with the men who had struck. This was particularly the case in the malleable iron department, where our records show that although the new men were laborers and handy men about the works, very few, if any, of them having done any molding before, yet in a short time they were able to get out as much, if not more, work than the men who had struck, and at the present time they are producing on an average from 25 to 50 per cent. more work than the old men did. This is on identically the same work.

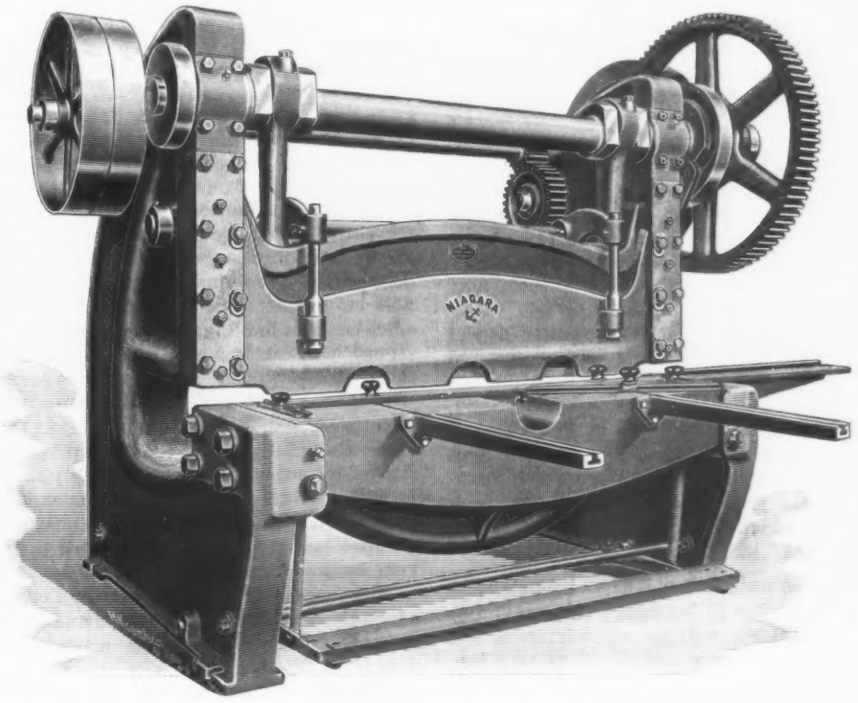
The facts that we have brought to your attention in this letter are about all that we can bring to mind at this particular moment. Will say, however, that we have had quite a struggle with union labor and we were obliged to get out an injunction to protect ourselves from interference with our business, and we are in a position to verify any of the statements made herein. There is no doubt that there are many other instances of interference with the output of our shops which we do not call to mind at this time. However, the above will give you an idea of what we have gone through in connection with the efforts made by union labor to limit the output of our works.

YORK MFG. COMPANY,
THOS. SHIPLEY, General Manager.

The Brown-Ketcham Iron Works, Indianapolis, Ind., have purchased 9 acres of ground at Greensburg, Pa., and will erect a large plant there for the manufacture of beam and column work, which they expect to have ready for operation by January. Three or four building are already planned and the excavation for them is being done. The main building, of steel, will be 56 x 300 feet and an assembling room 120 x 44 feet. There will be separate buildings for offices and power plant. The company have on hand now a great deal of work in the East and desire to get nearer to the Eastern field, nearer the supply of raw material and save a heavy freight bill on both raw and finished product. If present prosperity continues the Pennsylvania plant will be rapidly enlarged, the plans contemplating buildings capable of housing 700 workmen. The Indianapolis plant employs one-third that number. The company have the contracts on several of the largest buildings being constructed this year in the East and South.

The New Niagara Power Shears.

The Niagara Machine & Tool Works of Buffalo, N. Y., have brought out a new line of power shears capable of cutting ¼-inch iron or soft steel up to 126 inches. The housings have a gap or open throat 18 inches deep, so that sheets of any length can be cut apart up to 18 inches from the edge. The housings are connected by a heavy cross bar so disposed as not to interfere with the gap. The bed is heavily ribbed and its relative position to the cutter bar, laterally, can be regulated. The machines are double back geared, all gears being machine cut, and tight and loose pulleys are provided and a heavy fly wheel. The main shaft is forged of steel, with two cranks, and transmits power to the cutter bar by means of two solid connections. The hold down attachment in front of the cutter bar is intended to hold the sheet firmly upon the bed while being cut. It is moved up and down in a positive manner by a cam that is part of the clutch block, thereby doing away with the springs usually employed for raising the hold down. The hold down can be adjusted quickly for various thicknesses of stock. Means are provided for taking up wear on the guides, knives and other working parts.



THE NEW NIAGARA POWER SHEARS.

The motion is controlled by an automatic friction clutch which is tripped by a foot treadle. When the latter is released the cutter bar will stop at the highest point, and when the treadle is kept depressed the motion will be continuous. The table has T-slots running from right to left and from front to back. In line with the latter, brackets can be attached to carry the front gauge. The back gauge can be set close up to the lower knife for cutting narrow strips. On both ends of the bed there are side gauges, and there is also a bevel gauge. At the right hand side of the machine there is an extension gauge which is used in splitting sheets longer than the knives. After the first cut, the edge obtained at the previous stroke is used to gauge by, not the original edge of the sheet. In this manner proper alignment of the successive cuts is obtained.

Lake Ore Matters.

The Gogebic Range Beating Its Record.

DULUTH, MINN., October 12, 1902.—Up to October 10 the port of Ashland, shipping most of the Gogebic range product, had sent forward this year within 50,000 tons as much ore as that range sent down all last year—namely, 2,900,000 tons. There yet remains time for the port to bring its total to considerably above 3,000,000 tons and to make the total of the Gogebic range larger than in any previous year. It was in 1892, the year of chief activity before the panic, that the total for this range reached its high point, a point that it has not again been able to touch until now, but which will be passed by at least 350,000 tons this season. It is surprising to note that in 1893 the range sent out only 1,330,000 tons, compared with 2,971,000 the year before. An interesting fact of this year is that mines that have been idle or that have been working in a very small way since 1892 have found themselves again and are now once more important. The indications are, moreover, that these will be of permanent importance and that the production of the Gogebic will not again fall off so alarmingly as ten years ago. The development of deep mines on the range has shown that ore is to be expected under the series of pitching dykes that make across the narrow ore bearing formation to an unknown depth—to such depth, in fact, as the percolating waters have been able to penetrate. This being the case, what were regarded by almost all mining operators to be the bottoms of their mines have come to be regarded merely as dykes of more or less thickness crossing the formation and liable to be followed at greater depth by another similar dyke, upon which, and in the base of the angle formed by the foot wall and the dyke, there may be another concentration of ore of more or less value. Naturally such a conclusion changed the entire aspect of things upon the Gogebic range, and with every find in conformity to the new theory the possible future importance of the range has been increased materially. There have been several such finds of magnitude, and it is safe to predict that no mine on the Gogebic will again be considered a worked out proposition and abandoned until the underlying dyke material has been pretty thoroughly explored.

Cascade Range.

At the Winthrop mines of the Oliver Iron Mining Company a large tonnage will be mined this year, and the expectation is that this will be steadily increased for a long time to come. These mines, affording a low grade siliceous ore which is valuable as a mixture with ores that are coming into more and more extended use, are in demand. In the Winthrop locations, with their high stoping faces, their stripped surfaces of light covering of earth and their desirable ores, the company have a very valuable property, one far more highly regarded now than a few years ago. Two large open pits and two shafts are being operated. Some 400 men are busy there. In the open pits the ore is blasted down in immense blocks, one blast loosening enough for weeks. It is run to the shaft and hoisted to a crusher, whence it is dropped direct into cars, the labor cost being as small as at many of the most favorably situated Mesaba mines. The large stock piles that remained at these shafts last fall have all been shipped.

In the same neighborhood the Lake Angeline Company are exploring for ore at the old Mitchell and will probably mine a large amount of siliceous ore from close by No. 3 pit of the Oliver Company, where they are able to get a stoping face of at least 125 feet.

Other siliceous ores are probably to be mined another year by the Oliver Company, who not long ago bought large tracts of ore bearing lands on the Cascade range south of Ishpeming. Engineers have been on these lands lately doing work preliminary to the resumption of operations at some of the mines. Among those to be reopened is the Moore, where there is a large body of ore that can be mined cheaply. A crusher will probably be installed. On the Cascade range there are enormous deposits of this ore, which will be required in time. Much of this ore is of a Bessemer grade, carrying exceptionally small percentages of phosphorus. Properties in this range have been worked more or less for many years by lessees in a spasmodic sort of way.

Adjoining the Platt mine, on lands of the Pittsburgh & Lake Superior Iron Company, the Union Steel Company have found ore in test pits which promises well. Samples assay better than anything else found so far on the Cascade range, and this fact will probably lead to more extensive exploration there for other ores than the silicious deposits that have been considered the only ores in that part of the district. The property on which this find has been made will be explored carefully and rapidly, for the Union Steel Company are in need of considerable of this class of ore as well as of ores of other character.

Miscellaneous Notes.

Many Lake Superior diamond drill men who have been on the West African coast for the past year or two for the Gold Coast Trading & Machinery Company, who were looking for gold there, have returned to their homes. It is understood that the search was not as successful as was anticipated.

Construction work has commenced on the ore receiving docks at the new blast furnaces at Sault Ste. Marie, Ont., where the Algoma Steel Company have their works. The dock is to be of concrete and steel. The contract has been taken by H. E. Talbott & Co., who built the great dam for the same interests at the head of St. Mary's Falls to act as a compensation for the flow through the company's new power canal on the American side. The new ore dock will be nearly 2000 feet long and about 300 feet wide, and will be traversed the entire length by a Brown bridge carrying cantilever arms extending over the water for unloading. The dock adjoins the furnaces now nearing completion and will be connected with them by the newest and most efficient ore handling devices that the company can secure, so that the cost of handling ore to the top of the furnaces will be light. At present the furnace plant will consist of two stacks and seven stoves, and metal from these stacks will be taken hot to the Bessemer converters of the rail mill. This mill is gradually increasing its output and has added fish plates to its product. It will continue to add such Bessemer products as are in demand and can be produced. It is understood that an open hearth plant will be added to the works before very long.

The development of the Breitung ore properties north of Sault Ste. Marie continues and shipments of considerable magnitude will be made another year, it is hoped. The ore deposits north of Georgian Bay, in which John W. Gates and Joseph Sellwood are interested, are still under exploration and are said to be looking well, showing up a large amount of ore. Gates and Sellwood expect to thoroughly explore and develop these properties before disposing of them.

The most roseate reports come to the lake from the South Arizona copper properties which lake and Pittsburgh men are developing. Calumet & Arizona, the first one to become a producer, will blow in its first smelters, 300 tons daily capacity, before November 15, to be followed by a duplicate capacity three months later. The mine has now well above 1,000,000 tons of 8 to 10 per cent. ore blocked out and is ready for extensive mining. The heaviest machinery plant at any Arizona mine is being coupled up. Underground development is showing a richness that is seemingly unparalleled in the history of American copper mining. In the Lake Superior & Pittsburgh and the Calumet & Pittsburgh, the remaining developments of this group, shafts are down 900, 800, 700 and 300 feet, and ore is confidently expected before the deepest shaft has gone much further. D. W. W.

DULUTH, MINN., October 13, 1902.—The Penobscot mine, adjoining Hibbing, on the Mesaba range, passed to-day into the hands of the Union Steel Company, being purchased from Eddy Bros., its former owners, by the Donora Mining Company. The latter are a mining branch of the Union Steel Company. The Penobscot contained better than 10,000,000 tons of ore of remarkably uniform quality, having a depth of 225 feet. The

ore shows an extreme variation of less than four points. It has been mining about 250,000 tons annually, or enough to cover a ten-year low price contract with the National Steel Company, on which there are yet due 1,450,000 tons. The sale includes a pumping plant, good for 8000 gallons a minute, and also includes two large modern steel ore ships.

Prepositions of the Labor Question.

BY EGBERT P. WATSON.

A recent utterance from an authoritative source, the secretary of the National Civic Federation, leads me to think that many persons have formed erroneous ideas of the scope and character of labor organizations as shown by them in every day business experiences, and that they are, if not exactly blessings in disguise, associations which should be fostered and encouraged by all, to the end that the workman and the capitalist may lie down together in a business millennium. I can draw no other inference from the positive assertions made by the author of the article mentioned, because, while depicting the objects and aims of labor organizations—the "revised creed" is the title of the closing paragraph—the author speaks as if the revision was already in force and that a new commercial heaven and a new earth have been formed wherein there is to be, hereafter, no disagreement. For one I would be glad to do business under the new dispensation, but in order to feel secure in transactions, prior to assuming responsibilities, I, and others, too, I fancy, would like to know the probabilities of the new departure in labor organizations being faithfully observed under all circumstances. Mark Twain was requested to place a bet upon a certain race horse, but he declined upon the ground that he was a stranger in the land and did not know any one to hold the stakes, whereupon the party of the first part pointed out his friend Jones and said he would act as stakeholder. Mr. Twain scrutinized Mr. Jones for a moment and then said: "Yes, but who will hold your friend Jones?" This is pertinent to trade union promises and resolutions; they are not new, and experience in the past leads those to whom they are tendered to regard them with apathy. At this writing one of the staples of life and trade, coal, is withheld from the people by the acts of trade unionists, who must have been in possession of the determination to turn over a new leaf some weeks ago, but possibly concluded that it did not refer to them, for this "revised creed" says, *verbatim:*

"1. Strikes are bad and should be a last resort.

"2. Scales of wages should be determined by mutual concessions in conference with employers, rather than by a demand submitted by the union as an ultimatum.

"3. When thus determined this scale becomes a contract, which is not only as sacred as any business contract, but the violation of which by the union is the most disastrous blow that can be struck at the principle of unionism.

"4. Sympathetic strikes are unwise because they violate contracts, bring injury to friendly employers and the friendly public, and arouse public opinion against the organization.

"5. It is not essential to a contract that nonunion men should be excluded from employment along with union men, provided they receive the same pay.

"6. The union should attract the nonunionist by persuasion, not by force, into membership.

"7. Violence in conducting a strike alienates the public, brings the courts and the militia to the support of employers and reacts disastrously upon the union.

"8. Unionists should welcome new machinery.

"9. Unions should abandon arbitrary restrictions on output and direct their attention to hours of labor and rates of pay."

This is a tolerably long list of what men who are quarreling with their bread and butter should observe, but it must be said that if they did there would be an end of all the troubles that exist at present, and, likewise, an end to unions. Paragraphs 6 and 7, if put in force, would leave disorganized labor high and dry on shore, and they are sharp enough to see it.

Trades unions exist only by arbitrary acts and pronunciamentos, and there is no trust in existence which exercises such absolute control over its members as labor associations do. In the town where I live a union man is fined $25 if he merely works in the company of a nonmember. If a man who does not belong to the association is employed in any capacity where society men are, the work stops until he is removed. A member of a certain trade which was on strike for higher wages found a job out of town, and applied to his association for a traveling card. It was given him and he went away and remained for three months. When he returned and applied for admission to the union again he was refused until he had paid the initiation fee over again, upon the pretext that he had left the town and was not a citizen of it! These acts are perpetrated without any hearing of the facts in the case, and the sufferer has no recourse whatever. Now, in the face of them, is it worth while to descant upon the great value to the workman of his union? Is it of any service to business, or any security to their interests, to publish an essay upon what trades unionists have learned in the past, when a strike accompanied by violence, intimidation and actual manslaughter exists at this hour? I should say not; and not until the law enforces the privilege of an American citizen to sell his labor at his own price will overt acts cease. It will take some time to assure workingmen that they are secure, for turbulence extending over a generation cannot be suppressed in a few weeks. When all men are free again that day will see the end of trades unions as they now are, for there will be no reason for their existence.

Shenango Valley Notes.

The Glen Mfg. Company have been organized by New Castle and Ellwood City parties, and a plant is to be erected at Ellwood City for the manufacture of novelties in iron and steel. R. A. Todd, John C. Offutt and A. H. Kugerman are prominently interested.

The tin mills of the Sharon Steel Company will be started up within a few days.

The Shenango Valley steel mill at New Castle is closed for repairs.

Ellwood City plants are nearly all running prosperously. The large power dam, with an electric generating plant connected, which has been in course of erection near Ellwood City for the past year, is now nearly completed. The Stanley Company of Pittsfield, Mass., are installing the machinery at the present time. The company will be able to furnish power much cheaper than it can be obtained from coal and an impetus to the manufacturing interests of the busy town is confidently looked for. It is believed, however, that the greater portion of the power which will be generated by the plan will be used to operate an electric railway from Beaver Falls to New Castle, a line which is much needed and for which charters were taken out nearly two years since.

The Marquis Limestone & Clay Company of New Castle are making extensive improvements on the rolling stock of their narrow gauge railroad. Three new locomotives are being secured and the cars are being rebuilt.

The Colorado Steel Castings Company have been organized with a capital stock of $500,000, the incorporators being John I. Franklin, C. F. Springer and J. K. Vanatta. The company have already purchased 180 acres of land at Colorado City, Col., upon which the construction of buildings is expected to start within the next 60 days. The plant is to be equipped with electric traveling cranes and open hearth revolving furnaces, together with the latest facilities for handling heavy steel. One hundred men will constitute the working force of the plant at the start, most of whom will be skilled mechanics from Eastern institutions. The company own several valuable patents, one of which is the Springer safety coupler.

The Brice Kiln and Furnace.*

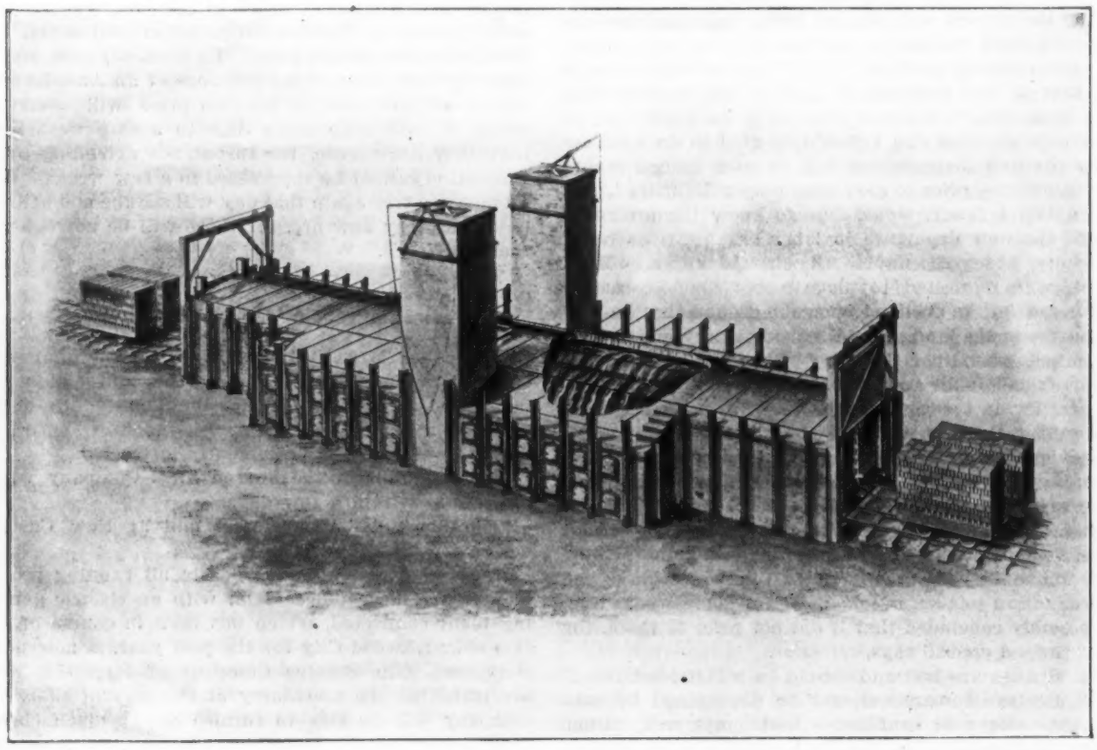
In many lines of trade manufacturers have realized the necessity, in order to keep up with competition, of getting as much as possible out of their plants. How to do this has been a problem which has occupied perhaps the greater part of their attention. There are few products on the market to-day which have not been subjected to the common process of evolution within a score of years and which are not turned out more expeditiously and in greater quantity than was the case 20 years ago. Many of these products owe their present cheapness to a process of manufacture which might be termed the continuous process—that is, a process which permits of the turning out of products without a stoppage of plant or machinery, in contrast to a plant or machinery operated intermittently, intervals being required for attention to or renewal of some important factor in the general service.

While, as has been said, many lines of manufacture have been improved, there are one or two lines which are notable among the exceptions—namely, the brick and common or natural cement industries. While to an extent strides have been made in processes for handling the product before and after the burning stage, the main obstacle in the way of making the manufacture of these materials a process embodying economy and dispatch as well as effectiveness has been the lack of facilities for continuous burning or calcining. As every one knows, the present style of kiln requires occasional cooling and refiring; accordingly the kilns in a plant can only be run a portion of a working period.

The accompanying engravings illustrate a new kiln or furnace, the second of its type ever built, and now in successful operation at the plant of the Coplay Cement Company, Coplay, Pa. This furnace was built by the Brice Patent Kiln & Furnace Company of Philadelphia, Pa., and was designed to supersede entirely the form of intermittent kiln hitherto used, and to be under fire and in work continuously. It is comparatively simple in construction, its efficiency being altogether due to the arrangement of the flues and the provisions made for the entry and exit of charges without lowering the temperature existing at the fire zone. It has been used successfully for burning fire brick, all kinds of building brick, vitrified brick and cement rock. The fire brick was of the high quality used in steel works. The furnace has proved equally as effective in roasting ores.

The furnace is serviceable for other purposes requiring a high and continuous heat, and has possibilities as a furnace to take the place of that commonly used in the annealing of malleable iron castings.

The furnace has a track running entirely through it and is 123 feet long, the width being about 24 feet. The fire zone takes up about two-thirds of the whole structure, and is heated by ten fire chambers on each side, each having two firing doors, as shown in Fig. 2. The fronts of these fire chambers are of cast iron with ordinary draft doors underneath the firing doors. The stacks for the disposition of the waste products of combustion are only 29 feet 4 inches high, but are quite ample, the combustion being so perfect that little or no smoke is emitted through them, even when the poorest kind of fuel is used. The furnace is braced by sections of steel I-beams, Fig. 3, which are in turn braced by iron rods at the top and bottom of the structure. The doors are of steel plate, Fig. 4, with a fire brick lining, the fire brick being of special shape and supported by iron rods passing through it. The doors are counterbalanced and have a locking device on each side which renders them perfectly air tight. The charges are placed on cars, which are drawn through the furnace by means of a wire cable operated temporarily by a hand wheel or drum. As a car with burned material is withdrawn at the delivery end a car loaded with raw material enters simultaneously at the charging end, Fig. 6. Suitable provision has been made for the use of steam power later on for moving the cars, raising and lowering the furnace doors and raising and dumping the cars.



THE BRICE KILN AND FURNACE.

The bottom of the furnace is formed by the cars, which are 10 feet long by 8 feet wide, and are so constructed that each one telescopes with the car ahead, making a close and perfect connection, so that a practically air tight furnace bottom results. The view, Fig. 3, was taken underneath the furnace at about the center of the fire zone. The under bracings of the furnace are seen, with the wheels of the cars on the tracks above them. The construction of the cars is simple. The bodies are made of steel plates with a platform of fire

* Paper read at Philadelphia Foundrymen's Association.

brick. On this platform the material forming the charge is laid in two parts, so that a lane of good size separates them. On each side of the car and under the platform is a projecting plate running lengthwise of the car, which plate runs in sand boxes, Fig. 4, along each wall of the furnace. As a car is run into the furnace the plates and the sand boxes make a practically air tight seal.

When the furnace is loaded to its full capacity there are 12 cars in it, seven in the center, or fire, zone, two in the rear, or drying, chamber, and three in the front, or cooling, chamber, from which exit is made. The cars weigh about 3500 pounds without the fire brick forming the platform.

The heat in the furnace is very readily controlled. The normal temperature, under what might be termed average firing, is about 2250 to 2400 degrees F. This temperature may be reduced by less firing or a curtailed grate surface to any point wanted; or it may be increased by strong firing at least 500 degrees. The utility of the furnace in the annealing of malleable cast iron is something that has not yet been determined, but the possibilities in the way of an adaptation for this purpose appear to be very great. In the use of the furnace a great saving of labor and fuel is effected, in that when once heated there is no further loss of fuel for reheating; and when material is taken in its primary condition and

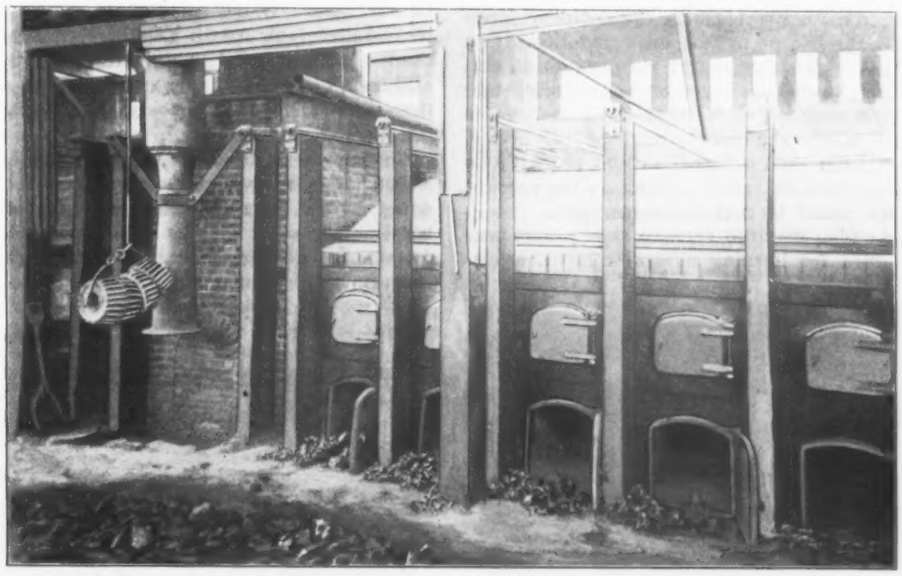


Fig. 2.—Furnace Front.

Fig. 3.—Beneath the Furnace, Showing Car Bottoms.

Fig. 4.—Furnace Closed, Showing Sand Box Seals.

THE BRICE KILN AND FURNACE.

The cars are conveyed from end to end of the furnace on tracks. These trucks form part of the track system and interlock with the rails in the furnace and on the outside runway. They are temporarily propelled by a sprocket wheel and chain, operated by cranks, one man easily moving a loaded truck. These trucks will eventually be operated by steam power.

At the time the photographs were taken the furnace was running on common cement, the load or charge on each truck being equal to about 30 barrels, or 10,500 pounds, of cement, and the daily output running from 1000 to 1500 barrels of cement per day of 24 hours.

The furnace is operated under natural draft, and the coal consumption at the present time, with the very poor fuel, principally composed of dirt, now in use, is about 12 tons per day of 24 hours; or figured on the output, a little over 2 cents per barrel for fuel. This cost is, of course, based on a normal condition of the coal market.

placed on a car it is handled twice only before becoming finished material ready for use.

Discussion.

In discussing the paper Geo. C. Davis said:

The kiln described here to-night suggests some interesting possibilities to malleable iron men, as one of the earliest types of annealing oven used in this country was a continuous kiln "shoving furnace," as it was called, owing to the pots being pushed in at one end and thus moving the whole charge along.

The intermittent type of oven now in general use in malleable iron works can be criticised on several grounds —namely:

1. It is slow work charging and discharging.

2. The trucks used in handling the pots are not adapted to carrying them any distance, and consequently a large space is needed in front of the ovens for packing and unpacking.

3. The oven is not working a large part of the time; it is practically cold when charged and takes about 24 hours after the fires are started to get up to an annealing heat. After running, say, two to four days, it has to be cooled off and discharged, and so on.

4. It takes an undue proportion of the coal used on each run to get the furnace up to its working temperature. All this heat is lost every time the oven is cooled up and discharged.

It would seem to me that if the annealing pots could be loaded on trucks similar to those shown, running on a track that could extend wherever needed in the works, it would greatly simplify the handling of castings, both before and after annealing. One possible difficulty with an oven of the type illustrated would be the heating on the lower pots. This is overcome in the ordinary intermittent type by the use of bypass flues underneath, an arrangement that is probably out of the question in this continuous oven. Possibly a layer of hollow brick laid on top of car, forming a flue, so that the heated gases could pass underneath the pots, would be of service. The waste heat from such a furnace could probably be utilized in drying cores or raising steam, as the amount of heat available would be reasonably constant.

It should be added that the furnace shown here was especially designed for burning natural cement, a material that is passed through with comparative rapidity, hence the necessity of a much longer furnace than would be required if used for annealing purposes.

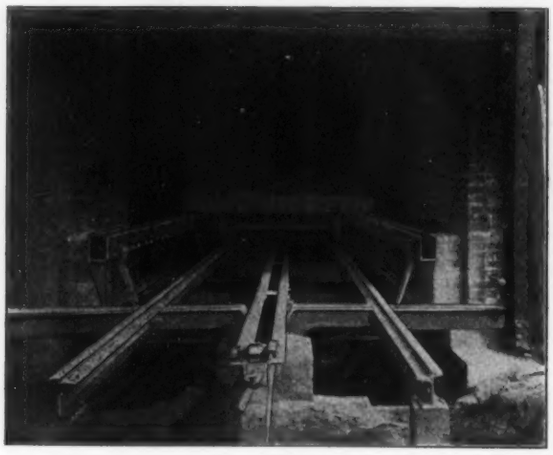


Fig. 5.—Looking Into Furnace.

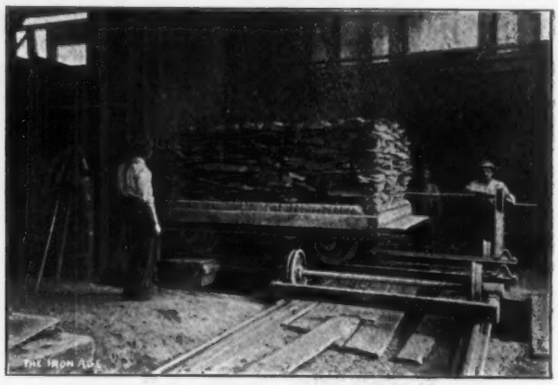


Fig. 6.—Charged Car Entering Furnace.

THE BRICE KILN AND FURNACE.

A Novel Elevator Equipment.—The Energy Elevator Company, Philadelphia, Pa., are installing in B. F. Keith's new Chestnut Street Theatre, in that city, a novel elevator equipment for the handling of scenery, &c. Four hoists will be furnished, consisting of a fire curtain hoist, two rug hoists and a paint frame hoist. All of these are of a design especially adapted for their particular purpose and a departure from anything heretofore used in that line. The hoists are all hand power and of the self retaining type, accurately balanced for their respective loads. The lowering device is separate from and works independently of the hoisting gear, and also acts as an auxiliary brake in event of the regular brake becoming inactive. Anti-friction self lubricating bearings are being used on all wearing parts and the hoists can be operated rapidly and noiselessly. The fire curtain hoist will have a lifting capacity of 1000 pounds, and is provided with an automatic stopping device. The hight of travel will be 75 feet, and it will be controlled from any one of six different points on the stage. The two carpet hoists are similar in construction and method of handling and will have a capacity of 1000 pounds each. The paint frame hoist will be equipped with two speeds, and will have a capacity of 2000 pounds. The hight of the lift will be 50 feet, the dimensions of the paint frame being 50 x 35 feet.

Utilization of Blast Furnace Gas in Gas Engines at the Ilsede Works in Germany.

Fritz W. Lürmann of Osnabrück has an interesting article on the above subject in a recent number of *Stahl und Eisen*, from which we take the following particulars:

In 1899 the works put in for experimental purposes a 60 horse-power Dentz gas engine, to be used with blast furnace gas, obtaining very satisfactory results. As soon as the use of larger engines of this type had proved its feasibility the firm proceeded to the erection of a blowing engine driven by a gas engine of the Oechelhauser type and have now ordered a second similar machine. By means of these engines and others to be installed later a still greater economy in the use of the furnace gas will be obtained, although the executive officers of the works in question had devoted much time and money to economy in this direction before introducing gas engines.

In order to make use of the gas saved by these means a 6000 horse-power electric central plant is being installed, which at the start will have two gas engines of 1000 horse-power each, coupled direct to Siemens & Halske dynamos. The engines, each with two cylinders, are being built by the Aschersleben Machine Company under the Oechelhauser patents. The charging pumps lie above the floor level and are coupled direct to the traverse, which forms the connection between the back and front cylinders. The dynamos, so constructed that a fly wheel is unnecessary, give an alternating current of 10,000 volts. With the six engines, which will finally be installed in a building 148 x 213 feet, it is hoped that there will be available for the rolling mills 6000 horse-power, instead of the 1300 horse-power now given them by the present electric generators driven by steam. Plans on the scale outlined have heretofore been confined to the works at Hoerde and Differdingen.

The gas power blowing engine mentioned above was installed by the German Gas Power Company of Berlin and consists of a single cylinder Oechelhauser motor of 500 nominal horse-power built by Borsig of Tegel, coupled direct to a blowing engine built by the Siegen Machine Company. This engine, fitted with Riedler valves, has a cylinder diameter of 63 inches and 37½-inch stroke. Each revolution actually draws in 129 cubic feet of air, which is delivered to the cold blast main at a pressure of 8.5 pounds per square inch. The intake valves are fitted with a mechanism by which, when the wind pressure rises, the amount of air taken in may be decreased, thereby preventing any overloading of the gas engine. Practice has proved, however, that this is unnecessary in ordinary circumstances. To variations of the blast pressure between 7.1 to 10.6 pounds per square inch the machine accommodates itself auto-

matically without the engineer having to touch the valve regulating the amount of gas. If the blast pressure increases to 10.6 pounds, or runs down to 7.1 pounds, the engine slows down or runs faster and then remains stationary at a speed corresponding to the pressure. As soon as the nominal pressure of 8.5 pounds is reached again the engine regains its normal speed of 100 revolutions per minute, which, however, can be increased if necessary. The work of the gas engine therefore remains approximately the same whatever the blast pressure, provided, of course, that no regulation of the amount of gas takes place. A governor for such regulation was provided for the engine, but, proving unnecessary, was put out of use. If the gas is regulated the speed remains about the same with varying blast pressures, while the amount of work performed varies. In this case the engine must be capable of considerably exceeding its nominal horse-power. Practice has shown that large gas engines possess a greater reserve of power than was at one time credited to them. The Ilsede gas blowing engines can, for instance, keep up 600 horse-power indefinitely and 700 horse-power for short periods, and it is therefore possible to blow at a higher pressure without fear of reducing the amount of air taken in owing to the engine slowing down. The engineer simply has to open further the valve which admits the gas to the engine. Starting is effected easily and efficiently by means of compressed air, which is admitted once or twice to the cylinder, whereupon the engine starts and in a few seconds attains its normal speed. The cylinders are 26.57 inches diameter and the stroke is 37½ inches. The crank shaft is constructed of several parts and is perfectly balanced without the use of any counterweights, and in consequence of this and of the balanced construction of all moving parts the engine runs very quietly, without any jarring of itself or its foundations.

The pump for filling the working cylinders is situated below the floor level and is used to pump gas from one side of its piston and, from the other side, air to clear the products of combustion from the working cylinder. The pump is constructed of such size as is necessitated for pumping the explosive mixture, as was originally intended in these engines, but practice has shown that it is sufficient to pump pure gas and let the admixture with air take place in the working cylinder. The Ilsede machine is worked in this manner, which has many advantages over the former. The pump cylinder is too large for its present use and, in consequence, it has to work against a considerable vacuum; but in spite of this fact the pump uses less than 10 per cent. of the indicated power of the working cylinders. Other engines built on this system will have a smaller gas pump, whereby the power so used will be reduced to 6 per cent. or at most 7 per cent. of the indicated power of the engine.

Before the engine was accepted by the Ilsede works it was subjected to a running test of 192 hours, after which the cylinder and piston showed themselves in the same good condition as at the start.

The Jones & Laughlin Steel Company.—At a board meeting of the Jones & Laughlin Steel Company, held in Pittsburgh last week, it was decided to issue $10,000,000 in bonds, none of which, however, will be placed on the market, to provide for extensive improvements that are now under way and also others that are contemplated. It is probable that within the next year the Jones & Laughlin Steel Company will build two more blast furnaces in the Pittsburgh district. The melting and rolling capacity of the steel works is now considerably larger than the metal output and the company frequently find it necessary to buy pig iron in the open market. The ore operations of the company are also to be materially enlarged in their scope. The concern have just started up a third 10-ton Bessemer converter, which will increase their output of steel about 500 tons a day. A large blooming mill is under construction and within a short time the Jones & Laughlin Steel Company will be making nearly 4000 tons of steel a day. The finishing mills are being very much improved and the concern have a continuous bar mill which if pushed could turn out nearly 1000 tons of steel bars a day.

Canadian Customs Requirements.

John McDougald, Commissioner of Customs, Ottawa, Canada, has issued circulars calling attention to certain requirements as to marking packages of goods and making out declarations on invoices which are of great interest to manufacturers in this country who are exporting their products to Canada. Following are the regulations relative to marking packages:

In order to facilitate the customs entry of goods imported from the United States into Canada shippers are advised that the way bills should show full information regarding name and address of consignee, marks and numbers of packages and description of packages.

Where goods are shipped in bulk the number of pieces, bundles, bushels, &c., is required.

In the case of agricultural implements the number and description of each class of implement is to be stated, except when packed in cases, crates or other containers, when the number and description of such packages should be stated.

It is very important that way bills show the required information, in order that the "carrier" may furnish the reports required to be made at the Custom House and prepare manifests for transporting the goods in bond.

It is required also that invoices from the exporter in the United States (and elsewhere) to the importer in Canada (which are uusally sent by mail), shall truly show the whole and actual value of the goods, with the quantity and description thereof, and the marks and numbers on the packages, in such a manner as to indicate truly the quantities and values of the articles comprised in each exportation package, the packages to be legibly marked and numbered on the outside when of such a character as to enable such marks and numbers to be placed thereon.

Following is the prescribed form of certificate or declaration on invoices, which is to be signed in full, and not by initials, by a partner, official or employee of the exporter having a knowlege of the facts certified to, and it is to be written, printed or stamped on the face or back of the invoice:

This invoice is true and correct, and where there is a difference between any of the prices shown therein and the ordinary credit prices at which the same articles are now sold *bona-fide* by the exporter in like quantity and condition at this place for consumption in this country the latter prices are shown on the margin or elsewhere on such invoice.

Dated at.....19..

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Exporter.

Geo. G. Blackwell, Sons & Co., Limited, Liverpool, England, report a growing demand for fluorspar for the desulphurization of steel in the basic furnace. It is claimed that as compared with other methods of desulphurization the use of fluorspar is the cheapest as well as the most effective. It is also an excellent flux, and has been found useful in blast furnace practice not only in preventing scaffolding but in removing scaffolds when formed. In the open hearth furnace experience has shown that the most useful form in which to add the fluorspar is the crushed or what is known as the "smalls" spar, as in that form the action is rapid and energetic. The demand for fluorspar in this country has been so large that users have had difficulty in obtaining regular supplies at a low enough figure, particularly during winter months, when many mines are compulsorily shut down. Blackwell, Sons & Co. state that they are prepared to deliver their well known "smalls" spar to any works in the United States and to guarantee regular monthly deliveries, winter and summer. They already hold annual contracts with leading American steel works.

It is stated that the trial trip of the British first-class armored cruiser "Drake," 14,100 tons, proved that she is the fastest war vessel in the world outside of torpedo boat destroyers. She made 24.10 knots, which high speed was partly due to an improved type of propeller. The contract provided that she should attain a speed of 23 knots.

Report on Naval Construction.

WASHINGTON, D. C., October 14, 1902.—The annual report of Admiral F. T. Bowles, chief of the Bureau of Construction and Repair, has been transmitted to the Secretary of the Navy, through whose courtesy the correspondent of *The Iron Age* is enabled to present the abstract given below. The report is of special interest as it is the first prepared by Admiral Bowles since he succeeded to the position of chief constructor of the navy.

Delays in Construction.

Progress upon new vessels under construction during the past year has not been satisfactory. All the larger vessels have been delayed by nondelivery of structural steel, the vessels building at the Union Iron Works, San Francisco, by a strike beginning May, 1901, and ending in March, 1902, and the battle ship "Nebraska" by a strike which has as yet prevented any actual progress upon the structure of the hull. The delay in the delivery of armor for the battle ships "Maine," "Missouri" and "Ohio" and the monitors "Arkansas," "Florida," "Nevada" and "Wyoming" has retarded the completion of these vessels concurrently with other causes. The inability of shipbuilders to obtain a sufficient force of skilled workers has been in many cases an important factor in the slow progress of the vessels. The extensive delays previously existing on the torpedo boats and destroyers authorized under the act of May 4, 1898, are being terminated by the satisfactory delivery of these boats under the modified conditions approved by the Department and specially reported upon jointly by the Bureau of Construction and Repair and the Bureau of Steam Engineering. The submarine boats building have not yet been offered for trial by the contractors, though with the exception of those building at the Union Iron Works, which were delayed by the strike, they have been reported practically completed for several months.

Owing to the delays which occurred on the part of the contractors in beginning the construction of the battle ships of the "Virginia" class, the armored cruisers of the "Pennsylvania" class and the protected cruisers of the "St. Louis" class, an opportunity was afforded to the Bureau to make a careful revision of the general plans of these vessels, which has resulted in a considerable improvement in their military value and in their habitability.

Plans for New Vessels.

Congress in an act approved July 1, 1902, authorized the construction of two first-class battle ships of not more than 16,000 tons displacement, two first-class armored cruisers of not more than 14,500 tons displacement and two gunboats of about 1000 tons displacement. Under the provisions of the act approved March 2, 1901, which required the Secretary of the Navy to submit to Congress in December of that year the descriptions of the battle ships and armored cruisers recommended for construction, the plans for battle ships Nos. 18 and 19, the "Connecticut" and "Louisiana," were adopted and approved by the Secretary of the Navy under date of July 22, 1902. Advertisements for bids for the construction of the "Louisiana" were published on August 1, 1902, upon which bids were opened on October 1, 1902. The plans and specifications for the 14,500-ton armored cruisers Nos. 10 and 11, "Tennessee" and "Washington," are practically completed and will be ready for advertisement at an early date, and also the plans for the 1000-ton gunboats Nos. 17 and 18, the "Dubuque" and "Paducah." Tugboats Nos. 8 and 9, also authorized in the act of July 1, 1902, under the appropriation for the Bureau, have been ordered built at the navy yards, Boston, Mass., and Mare Island, Cal., respectively.

Building the "Connecticut" in the New York Navy Yard.

Congress in the appropriation act approved July 1, 1902, provided that one of the battle ships authorized by the act should be built in a navy yard to be designated by the Secretary of the Navy. The navy yard, New York, N. Y., having been designated by the Department and $175,000 having been appropriated for the purpose of preparing and equipping such yard for the construction of the vessel, the Bureau took immediate action upon the necessary preparations, which involved the construction of a new building slip, the purchase and erection of an electric traveling cantilever crane for handling material on the building slip, the alteration and extension of two shops, one of which was already contemplated and provided for by special appropriation, the extension of the railroad track, and the vacating of a temporary storehouse by the Bureau of Supplies and Accounts which had been located at the head of the building slip in a position required for construction work. The Bureau approved the plans of the new building slip on July 12, 1902, and forwarded them to the Bureau of Yards and Docks for execution. The requisition for the electric crane was approved on July 23, 1902, and even though from the same pattern as those previously supplied by the manufacturers, the earliest possible delivery which could be secured was nine months from the date of the contract. The alterations in building have been approved and begun by the Bureau of Yards and Docks.

Plans and specifications for the "Connecticut" were forwarded to the navy yard, New York, N. Y., with authority to begin the construction of the vessel, on August 11, 1902. Advertisements for the steel materials to be used in the construction of the hull were issued by the Department on August 1, 1902, and contracts awarded for a total of 7466 tons at a total cost of $462,691.87. The provisions of specifications and the terms of the contract for this material have been made in such a manner at to absolutely insure the obtaining of this material at as low a price as that at which it will be supplied to private shipbuilders for the same class of vessels.

Congress, in the appropriation act approved July 1, 1902, made provisions in regard to keeping the cost accounts of vessels constructed in navy yards and those built by contract, as authorized by the act. By direction of the Department the Bureau of Construction and Repair prepared a scheme for keeping the accounts of the cost of the "Connecticut" in a manner that will at all stages of the work make it easily comparable with the cost of the "Louisiana," to be built by contract.

Vessels for the Training Service.

Acting in co-operation with the authorities of the naval training service the Bureau has prepared tentative designs for a sailing training vessel of about 1800 tons displacement, the length being 176 feet, mean draft 19 feet 6 inches; to be full rigged, built of steel, with double bottom, enough water tight subdivision for safety, with sufficient boiler power to distill water and provide for ventilation and sanitary appliances, and with sufficient room to comfortably carry a crew of 300 men. In compliance with the authority of the Department estimates are submitted for two such vessels to cost $373,000 each. The Bureau has also designed, to meet the wishes of those engaged in the training service, a small wooden sailing brig for use in connection with the training stations. The design is for a vessel of about 350 tons displacement and a mean draft of 9 feet 4½ inches; length between perpendiculars, 108 feet; extreme breadth, 30 feet; at an estimated cost of $50,000.

Standardization of Ship Fittings.

Substantial and encouraging progress has been made in the standardization of ship fittings. Private shipbuilders having contracts for naval vessels on their own initiative organized a conference upon this subject and from time to time during the past year have submitted plans of fittings which they recommended for adoption as standards. These plans have been subjected to criticism of the principal navy yards and the Bureau, and after revision by the shipbuilders have been developed into final form and adopted by the Bureau. During the past year 44 such standards have been adopted, including water tight man holes, water tight doors, air ports, coal scuttles, deck lights, warping

and towing bitts, lift and force pumps, water tight hatches, pipe flanges, portable ventilators, metallic ladders, boat davits and fittings, &c. In addition, general specifications for electrical appliances on ship board have been adopted, together with standard alloys of copper, tin and zinc. In addition to the preparation and issue of these standard details, the Bureau has prepared type plans for both ventilation and drainage for the following classes of vessels under construction: Battle ships of the "Virginia" class, armored cruisers of the "Pennsylvania" class, protected cruisers of the "St. Louis" class, protected cruisers of the "Denver" class, and the single turreted monitors.

Experimental Model Basin.

The work of the experimental model basin has been carried on satisfactorily during the year, and this adjunct of the Bureau is found of greater and greater value as time goes on. Among instances showing the value to the Bureau of the model basin may be cited the following: The first speed trials of the torpedo boat destroyers built upon the Department's designs proved disappointing, as the speed expected was not obtained. The contractors ascribed the difficulty to the shape of the boat and were desirous of making extensive changes which would have involved a cost of some $30,000 to $40,000. A few experiments made at the model basin showed that somewhat better results than would be obtained from the changes desired by the contractors could be obtained with comparatively slight changes which would cost on the average about $2500. These changes were made and later trials of the boats substantiated the results obtained in the model basin. Moreover, it was apparent, after the model basin trials, that in some instances the difficulty was largely with the propellers fitted by the contractors.

A number of experiments have been made in the model basin during the past year to determine the most desirable forms for the new battle ships and armored cruisers for which contracts will be shortly awarded. It is wholly due to the model basin facilities that the Bureau has been enabled to arrive at the very satisfactory results that the new armored cruisers of the "Tennessee" class, displacing 14,500 tons, may be expected to make a speed of 22 knots with actually somewhat less power than the preceding lot of armored cruisers of the "Pennsylvania" class, of the same speed, which displaced 13,680 tons. Similarly the two new 16,000-ton battle ships of the "Connecticut" class will drive appreciably easier at 18 knots than the preceding battle ships of 14,948 tons. Thus an increase of 7 per cent. in size in the case of the battle ships and of over 6 per cent. in size in the case of the armored cruisers has been accompanied with an actual reduction of horse-power necessary to drive them at a given speed in each case.

The shipbuilders of the country have continued to avail themselves of the facilities of the model basin in connection with their commercial work. During the fiscal year experiments were made for private shipbuilders at their expense with five models, and experiments are now under way, or authorized, with four models for three private concerns.

Improvement of Navy Yard Plants.

The improvement of the construction and repair plants at the various navy yards and stations has been conducted in the past by the Bureau so as to provide as far as practicable as the work progresses plants capable of dealing efficiently with the character of work usually current—namely, repairs—and at the same time, wherever possible, capable of dealing with new construction work. The policy of Congress for some years past having been against the construction of new vessels in the navy yards, the development and improvement of the yards in location of buildings, &c., have not been generally directed toward efficient arrangements for shipbuilding. The Bureau is of the opinion that it should be the obvious policy of the Department to so arrange the navy yard plants that they should be efficient for shipbuilding, which is in reality one of the most important functions which they may be required to perform.

Steel Inspection.

The total quantity of ship steel inspected by the Bureau and the amount passed and shipped for incorporation into naval vessels shows a large increase over the figures of the preceding year. The total quantity submitted to inspection under the Bureau's requirements during the fiscal year ended June 30, 1902, was 212,242,467 pounds, as compared with a total of about 70,600,000 pounds for the fiscal year ended June 30, 1901. W. L. C.

Central Pennsylvania Industrial Notes.

HARRISBURG, PA., October 11, 1902.—The Chesapeake Nail Works were closed Thursday and lack of fuel is the given reason. Employees have been notified to report on Wednesday. The nail mill is the first industry to close as a result of the coal famine, but every other plant in the city and vicinity is feeling the strained condition of the fuel market and all the outputs for the past week were below normal as a result. At the works of the Pennsylvania Steel Company in Steelton No. 2 Furnace has been banked and No. 4 is out of service. Steelton is experiencing difficulty in securing prompt shipments of coke and iron as well as soft coal. Not a pound of hard coal is now being used at the works. President E. C. Felton and Major L. S. Bent visited the works this week and made arrangements whereby the 9000 employees of the steel company can secure coal, one ton at a time, at the rate of $6 per ton. This is taken to mean that the steel company have plenty of coal at their command and that the present shortage is due only to lack of transportation facilities.

The Central Iron & Steel Company, as have most of the other iron companies in this section of the State, have contracts running to the end of the year for both coke and coal. This does not prevent a shortage at the works, as some of the coal companies are slighting those with whom they have contracts at low prices to sell to those who are willing to pay a bonus at the mines. This is true in the case of the Harrisburg Boiler & Mfg. Company, who this week were compelled to go on the open market for coke to prevent a shut down of the plant.

General Superintendent W. A. Garrett of the Philadelphia & Reading Railway Company was in Harrisburg twice this week in conference with officials of the Central Iron & Steel Company. While the conferences were private, it is understood that the Reading official requested the prompt delivery of iron in which the railway company are interested.

More than 700 bidders, representing firms in Pittsburgh, Reading, Lancaster and New York, attended the public sale of furnace machinery purchased recently by the State Forestry Commission. Among the successful bidders were Messrs. Wile of Philadelphia for a large amount of cast iron, boilers and engines, at $15.50 per ton; Derbyshire of Chambersburg, 100 tons of cast iron, at $18, and Frank Smith of Reading, who purchased nearly all of the machinery.

A building 450 feet long and 150 feet wide is being erected at Burnham, Pa., by the Baldwin Locomotive Works of Philadelphia for the storage of patterns and seasoned lumber. Much of the heavy work in the construction of locomotives is being transferred from Philadelphia to the works of the Standard Steel Company at Burnham. So many men are now employed at these works that all of them cannot find suitable accommodations at Burnham, and if quarters for them can be secured at Milroy, a village nearby, they will be transferred to that place.

The new frog, switch and signal department of the Pennsylvania Steel Company, at Steelton, has been put in operation and several hundred men are now employed there. The old plan will be used for other purposes. The new plant is working double turn on rush orders.

The Standard Steel Car Company will build 500 cars for the Philadelphia & Reading Railway Company at their plant in Butler, Pa., and the American Car & Foundry Company 500 at their plant in Berwick, Pa.

The Pennsylvania Railroad Company have awarded contracts for the structural iron to be used in the con-

struction of the new shops at Edgemoor to the Phœnix Iron Company. There will be 12 shops in the group. The contract includes the boiler, erecting and machine shops, blacksmith and boiler shops and planing mill.

Operations at the York Rolling Mill have been suspended owing to the exhaustion of soft coal. This is the first of York industries to be closed on account of the coal strike. Over 150 hands have been thrown out of employment.

The Harrisburg Mfg. & Boiler Works Company have booked a large order for pipe for export to Spain.

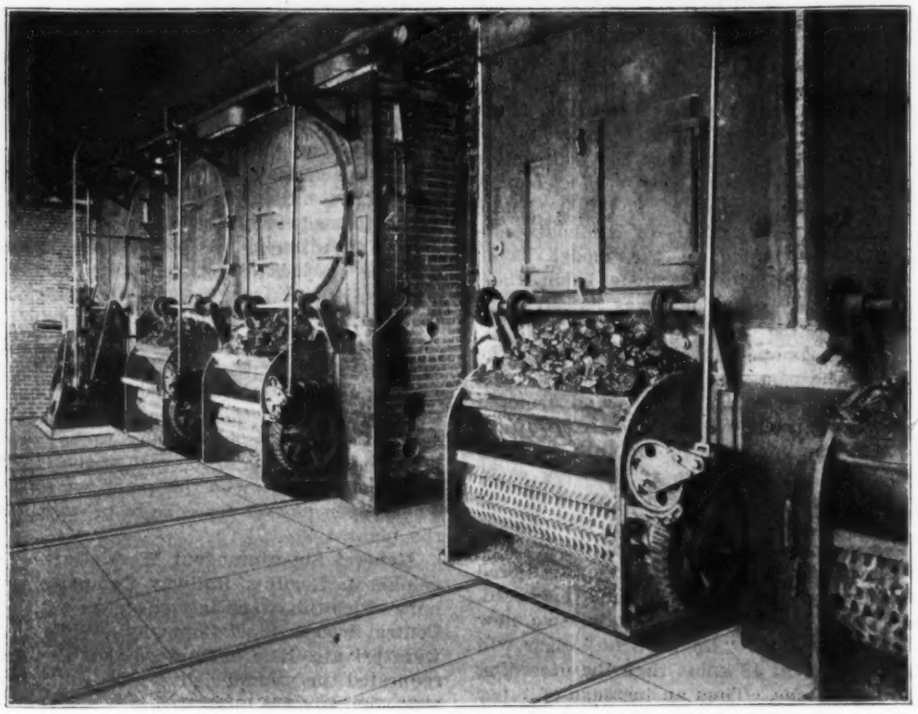
A new furnace for the reheating of blooms is being erected at the Lucknow shops, above Harrisburg. The foundations have been completed and it will be in operation within a few weeks.

The chain department of the West End Rolling Mill Company, Lebanon, has received the contract from the United States Government for the heavy cable chain needed for harbors in the Philippines. The chain works have also secured a large contract from the United States Lighthouse Board for the necessary 2⅛ and 2¼ inch stud link chain for the coast service for the fiscal year. The output of the chain works is largely used by the United States Government in the various departments. Chains for harbor improvements made by the Government in Cuba and Porto Rico are made at the Lebanon works. S.

A Costly Test.—It is stated that the British Admiralty has decided to break up the torpedo boat destroyer "Wolf," at Portsmouth, with the object of discovering wherein lies the weakness which has led to so many mishaps and disasters in the case of these craft during the present year. The "Wolf," which was launched in 1897, at a cost of $1,250,000, has been placed in a specially fitted dry dock while awaiting the costly operation. The steel cradles will first be removed from amidships and the vessel will be left hanging by her ends, in order to ascertain if the sagging strain thus imposed is sufficient to break her back. If she survives this ordeal the "Wolf" will be hung see-saw fashion across the cable, both ends being left unsupported, so as to show how she would fare if lifted amidships on the crest of a wave. Other tests will be applied. Great interest centers in the outcome of the experiment, from which the naval architects anticipate obtaining most valuable data for designing future torpedo boat destroyers.

The Duluth Mechanical Stoker.

The natural desire to secure economy in the operation of a steam plant and the necessity of preventing, as far as possible, a smoking chimney are the parents which have produced for the industrial world mechanical stokers and other devices to attain full consumption of fuel within practical lines. To prevent the passing away in smoke of a large amount of carbon with the other products of combustion proper conditions are essential. Among the most important are a sufficient boiler capacity, continuous even firing, a proper amount of heated air admitted to the combustion chamber in a particular manner and a steady temperature in the furnace. The accompanying illustrations of a stoker manufactured by the Duluth Stoker Company of Duluth, Minn., are of interest in emphasizing the special features adopted to bring about the conditions above referred to.



Front View.

THE DULUTH MECHANICAL STOKER.

This stoker consists of a set of grate bars laid crosswise in the furnace, parallel to each other, and carried from front to back of the furnace over a number of fair leaders by two endless chains, one on each side. Each grate bar is provided with two wrought iron lugs on the lower edge, which hook into the chains, alternate bars hooking in from opposite sides. The upper faces of the bars are toothed and lock into each other, leaving a sufficient number of openings forming air spaces for burning the coal. At the back of the furnace the chains and bars pass over sheaves and thence return over fair leaders to the front of the furnace. In front of the furnace the chains pass over sprockets from which they receive their motion.

The construction permits a grate bar to be removed and replaced only when passing over the sprockets in front of the furnace, for at no other time are the teeth entirely disconnected from each other.

The sprockets at the front of the furnace, which give motion to the chains and bars, are operated either by worm gearing driven by a small steam engine placed above the box containing the gearing, or by a single

worm and worm wheel, operated by ratchet and eccentric motion, the eccentrics being placed on a line shaft above the stokers and the line shaft driven by a small steam engine placed at some convenient point in the boiler room. Worm and gear are inclosed in an oil tight and a dust proof shield. From four to six stokers may be driven by any one section of line shaft and its engine.

At the front of the furnace a hopper extends the whole width of the stoker, into which the coal is shoveled. On the stoker front is an adjustable distributing and regulating plate which extends across the whole width of the grate and is carried above it to whatever thickness it is desired to carry the fire.

In burning fine coal on ordinary grate bars all the coal that falls through the grate goes to the ash bed and is lost; with this stoker any coal dropping through the grate is caught by a shoe plate and carried along with the grate bars on their return journey to the front of the boiler, and falling on the fire hold floor under the hopper, is saved. At intervals, as the coal accumulates, it is again shoveled into the hopper.

At the front of the furnace, and about 1 inch away from the plate which forms the front of the stoker, is a 9-inch arch, which serves the purpose of protecting the front from the fire. From his arch, and extending back about one-third the length of the furnace, is the center or coking arch. The ashes and clinkers are dumped at the back end of the stoker. The stationary type of the Duluth stoker is mounted on wheels and can be run out from under the boiler furnace upon a track for the purpose of inspection or repairs. The igniting arches with their hot draft arrangements, as furnished with this device, form an important accessory to the stoker.

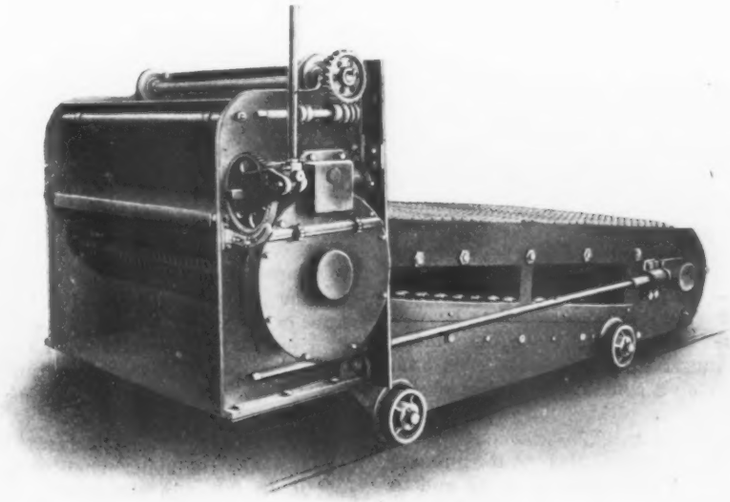


Fig. 2.—View Showing Operating Device.

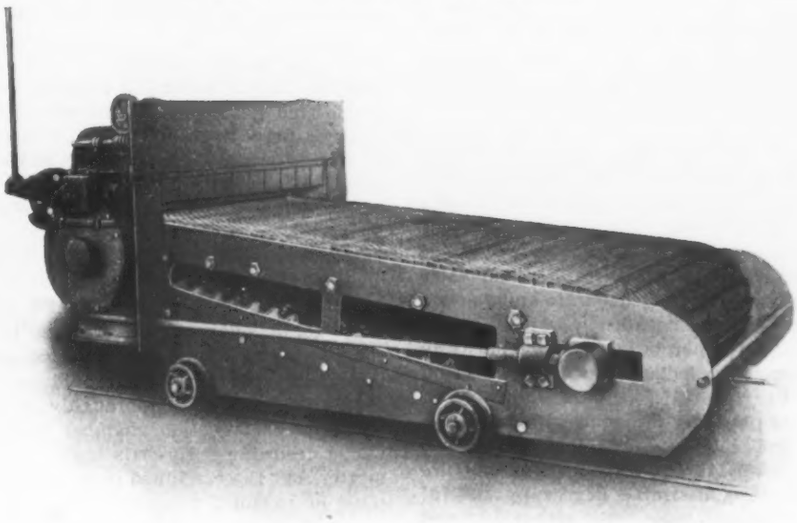


Fig. 3.—Side View of Stoker Removed.

THE DULUTH MECHANICAL STOKER.

The Standard Engineering Company.—A number of prominent officials of the National Tube Company and the United States Steel Corporation have organized the Standard Engineering Company, with a capital of $300,000, and a large plant will be built at Ellwood City, Pa., for doing all kinds of structural and engineering work. A site of 5 acres has been secured adjoining the plant of the Steel Car Forge Company, in Ellwood City, and contracts for buildings and equipment will be placed as soon as possible. John H. Nicholson of the Shelby Steel Tube Company of Pittsburgh is prominently identified with the new concern.

The Cumberland Realty, Coal, Iron & Mfg. Company, composed of prominent Kansas capitalists, have organized under the laws of Kansas with a capital stock of $300,000. The company have under negotiation the purchase of 18,000 acres of valuable coal and iron lands in Cumberland and Putnam counties, Tennessee.

The Suppression of Smoke in Steam Plants Using Bituminous Coal.*—III.

BY ALBERT A. CARY, NEW YORK.

Necessity for Intelligence in the Boiler Room.

In considering the problem of smokeless combustion no matter should receive greater attention than the selection of firemen.

With most steam plant owners, I regret to say, the general assumption has been that any man with plenty of muscle and brute force who can shovel coal and stand up before a hot fire holds all the requirements necessary for a fireman.

Such qualifications, uncombined with intelligence, are not only responsible for many smoky chimneys, but they are equally responsible for a large and unnecessary waste of fuel, to say nothing of the rapid deterioration which occurs in boilers, boiler settings and boiler appurtenances intrusted to such care.

Unintelligent brute force can be obtained at very low wages, but intelligence commands higher pay, and it remains for the steam plant owner to decide whether he will pay low wages and high fuel and repair bills (and also receive uncertain service) or whether he will pay a good price to his fireman and more than make up the difference by reduced fuel and repair bills, and, further, be able to count on a constant supply of steam at a uniform pressure.

No matter how refined a special furnace or automatic stoker you may have for your boilers, if you have not sufficient intelligence to operate it properly and to humor it to suit varying conditions, which exist in all steam plants, desirable results are impossible.

Automatic stokers require in their operation fully as much and sometimes more intelligence than does a plain grate bar furnace properly operated, and many times have I seen such apparatus condenmned in plants where their failure to work properly was wholly due to improper handling by ignorant firemen.

A good fireman should possess a rudimentary knowledge of the principles of combustion. Such knowledge would in most cases necessarily be more of a practical than of a theoretical nature. I have had some firemen describe to me in their own way just what would occur under different furnace conditions and the way their fire should be handled to get best results, and their descriptions were in the main very accurate and showed an excellent knowledge of their trade.

The fireman should further be able to demonstrate his ability to put such knowledge to good use by firing skillfully; placing every shovelful of coal where it will give the best results; promptly filling every hole in the fire bed through which cold air is rushing; keeping his fuel bed level and even throughout; keeping his fire box temperature up to a desirable degree by skillful manipulation of furnace doors, ash pit doors and damper; by avoiding unnecessary slicing but at the same time keeping his fuel bed sufficiently open for the free and even passage of air. He should also be able to tell very nearly the condition of his fire by watching the appearance of his ash pit. He certainly should understand the construction and operation of every piece of apparatus used in connection with his boiler, including feed pump, injector, valves, water columns, steam gauges and every other appurtenance, and be mechanic enough to repair them, especially when emergencies arise. He should be a man capable of advancing to the position of engineer, and an engineer thus brought up from the ranks will be far more valuable and capable in most cases than a man who has become an engineer through any other course.

The Pennsylvania and other railroads have learned the truth of this fact and they are constantly recruiting their force of engineers from these very firemen.

They even go further and encourage these men to become better employees by a premium arrangement, paying them a part of the cost of whatever coal they can save over and above a certain stated amount formerly found necessary to operate the same locomotive.

This is a practice that might be followed profitably in many stationary boiler plants, as I demonstrated most satisfactorily in a certain steam plant formerly under my charge.

In dealing with the smoke nuisance, Cleveland, Ohio, has recognized that the fireman is the most responsible man for this trouble, and in consequence it is proposed, I understand, to license their firemen, the same as they do their engineers, after they have qualified for this position, and thus steam plant owners will be forced to employ a better class of men. In plants where the smoke ordinances are violated the fireman will eventually have his license revoked if he does not handle his fires properly, and thus the fireman must do his duty in order to hold his job.

This is certainly the most advanced step toward the suppression of smoke nuisance that has thus far been taken. Other city governments would do well to follow the example of this wide awake city.

Designing the Grate Surface.

For the suppression of smoke in the ordinary plain furnace, careful design and skillful firing are required. For anthracite coal containing little or no volatile matter (the producer of smoke) it matters little where the grate is placed or how the firing is done, when we consider merely the smoke side of the problem, but from a point of economical steam generation these matters must be considered carefully, as well as the size of the grate, the available draft, &c.

Good practice places the grate surface from 24 to 30 inches below the boiler shell or tubes when anthracite coal is used, but in using bituminous coal this distance should be increased. Generally speaking, the greater the percentage of volatile combustible matter carried in the coal the greater should be the distance between the grate surface and the boiler parts above it.

After reading what has previously been stated, the reason for this requirement will be readily understood. The volatile gases distilled from the coal should have an ample free space to rise into, and with such conditions a lesser percentage of these hot gases will be thrown into an immediate contact with the chilling water surfaces of the boiler. Should the water surfaces be crowded down to within a few inches of the fire surface the draft would cause a rapid rush of the combustible gases over the bridge wall, while an increased distance between grate and boiler would decrease the rapidity of this flow and thus keep the combustible gases for a longer period over the hot fire bed, where their temperature would be maintained at the highest possible degree and they would be given a better opportunity to become thoroughly mixed with the air. An ample combustion chamber beyond the fire chamber is desirable with coals high in combustible volatile matter, but the combined combustion and fire chambers must be modified more or less according to the setting required to suit the type of boiler used. In some boiler settings the combustion chamber and fire chamber are necessarily combined as one.

The above considerations must be most carefully considered to obtain smokeless combustion.

In designing grate surface for boiler furnaces my practice is to look to past experiences with the particular kind of coal to be used, and find at what rate of combustion the best results have been obtained with the draft pressure available, and my new grate area is made to develop the required horse power when burning this number of pounds of coal per each square foot of grate surface per hour.

A furnace designed as described above is not only economical, but with proper firing it can be made to produce very little smoke, and the frequent departure from these principles of furnace design is largely responsible for many of the troublesome smoky chimneys seen.

It will now be understood that no one furnace setting can be built to burn all kinds of fuel with equal efficiency. A furnace properly designed to burn anthracite coal is not adapted to burn bituminous coal economically or smokelessly, while well designed bituminous furnaces may be illy adapted to burn anthracite, and a properly designed furnace for burning semi-

* Copyright, 1902, by Albert A. Cary.

bituminous coal carrying from 12 to 20 per cent. of volatile matter is hardly a proper furnace to burn Western bituminous coal, running from 35 to 50 per cent. in volatile matter. It will also be understood that forcing a fire beyond the rate of combustion for which the furnace is designed to be operated will be attended with decreased economy, and, in cases where bituminous coal is used, with smoke.

A careful consideration in the selection of plain grates is an important matter in securing smokeless results. No grate should be used for bituminous coal that has less than 50 per cent. air space. With some coals running high in sulphur and fusible ash, which sulphur acts as a flux with the ash, causing it to melt down on the bar as a slag and thereby close up the air spaces, no bar should be used that has its openings running in any other direction than from front to rear of furnace. This arrangement facilitates easy removal of the slag by use of the slice bar, while any other arrangement requires the shearing off of the slag at the surface of the bar by the chisel like end of the slicer, in some cases an almost impossible task.

The best results are, in most cases, obtained by burning bituminous coal at a high rate of combustion. This, of course, means a moderately thick fire and a high furnace temperature. High furnace temperatures are not necessarily due to a high rate of combustion, but rather to a properly regulated air supply, such as will produce a maximum amount of carbon dioxide (CO_2) with a minimum excess of air. When coals run high in sulphur and ash the melting of the ash resulting and the rapid accumulation of refuse on the grates (shutting off the air supply) destroy all of the advantages gained by rapid combustion, and in such cases less coal should be burned per square foot of grate.

It is claimed that with excessively high rates of combustion, such as is common in locomotive boilers, this slag becomes so porous that the throttling of the air supply passing through it is so slight that it has very little effect on the rate of combustion of the coal.

Heavy shaking grates exerting a powerful shearing action on the slag may obviate these difficulties in stationary plants.

Shaking grates are desirable with certain bituminous coals, keeping the air openings in the grate clear of ash, facilitating the free passage of air through the bars and fuel, and thus assisting in suppressing smoke.

Scientific Methods of Hand Firing.

There are three generally recognized methods for hand stoking a boiler furnace to produce the best results from both an economical and a smoke suppressing standpoint. These are commonly known as "coke firing," "alternate firing" and "spread firing" (or perhaps a more correct name for this last named method would be sprinkle firing).

Some bituminous coals will produce better results by the use of one method, while other coals may not be as well adapted to this one as to one of the other methods. This is largely due to the behavior of the coal when it is heated.

Some bituminous coals will exhibit little or no coking or fusing quality, but will tend to disintegrate when heated and fall into a more or less loose, powdery form. Such coal will not stand much moving about on the grate after it has once been charged into the furnace, such movement causing it to scatter, when some of it is apt to be lost either by falling through the grate bars unconsumed, or, in cases where considerable draft pressure exists, by being carried along with the products of combustion into the rear parts of the boiler setting.

At the other extreme we find coals which, when heated, will swell up and fuse into a coherent mass, forming a crust on top of the fire bed, but after the volatile matter has been distilled off from such coal the cake can be broken and easily moved about to any desired position on the grate bars.

If two such extreme coals can be obtained at one time they can often be mixed in proper proportions (determined by experiment) and used to much better advantage than when either is used alone.

Again we find it more desirable to use some one of these methods in preference to the others on account of the fireman's previous experience or else his ability to handle his fire better in one way than another.

It will be found that nearly all of the special furnaces and stokers depend more or less upon some one of these methods for their required system of firing, thereby in most cases allowing them to be classified under one of these three heads, which classification will be found most useful in making comparisons of their relative merits and desirability.

Coke Firing.

The coking system of firing is mainly applicable to furnaces delivering their gases over a bridge wall located at the rear of the furnace or else those running their gases back to or nearly to the rear of the furnace by use of a brick arch forming a roof some distance above the fire bed.

Fig. 1 illustrates the coking method of firing. In this furnace let us suppose that we have a hot bed of coal which has distilled off most of its hydrocarbonaceous matter, practically a bed of coke, which burns

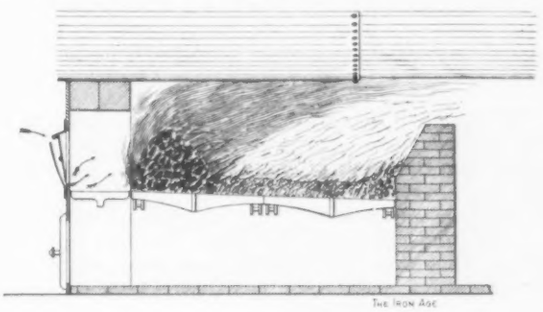


Fig. 1.—The Coking Method of Firing.

smokelessly. On charging fresh coal into the furnace, instead of throwing it directly upon this fire bed, we pile it just inside of the door, back of the dead plate, allowing it to occupy one-third of the length of the grate, more or less, and extending it across the width of the furnace from one side wall to the other. A slow distilling off of the volatile matter from the fresh coal pile will then follow, and these hydrocarbon gases must next flow over the incandescent bed of coke, through which flows an excess of air, highly heated in its passage, and as the air and gases are thus mingled at a high temperature perfect combustion should follow.

After most of the volatile gases have been distilled off from our pile of coal the fireman pushes this newly formed coke back upon the grates and this forms a renewed bed of practically smokeless fuel, and he then charges a fresh supply of coal in a similar pile across the front of the furnace.

After the fireman gets used to this method of firing and also familiarizes himself with the behavior of the coal thus handled with a properly designed furnace, he will succeed in obtaining practically smokeless results and he will find this method no more difficult to follow than any other rational one. From an economical standpoint varying results will be obtained, but generally a saving of fuel will result; in some cases as high as 10 per cent. saving has been shown as compared with the ordinary irrational methods of firing.

The principal disadvantages of this method are due to the length of time it is necessary to keep the firing doors open for charging and for cleaning. At such times a large amount of cold outside air rushes through the furnace, not only checking complete combustion, but also producing strains in the boiler parts more or less harmful.

This can be practically counteracted by closing the damper at such times, but cleaning a fire with a closed damper throws the dust and gases back into the boiler room, making it a dirty, malodorous place, and few firemen "enjoy" such cleaning with closed damper. Sometimes the damper is but partially closed as a compromise between these two troubles.

By continually shoving back from the front of the

furnace the coked coal, which, of course, carries in it all the ash, this ash accumulates in the least accessible part of his furnace—*i.e.*, in the rear, which not only increases the work of cleaning, but makes it a longer operation, the furnace door being wide open all the time.

This difficulty has been largely overcome by placing dumping grates at the rear of the furnace, shown in Fig. 2, which was invented by Chanter in 1843.

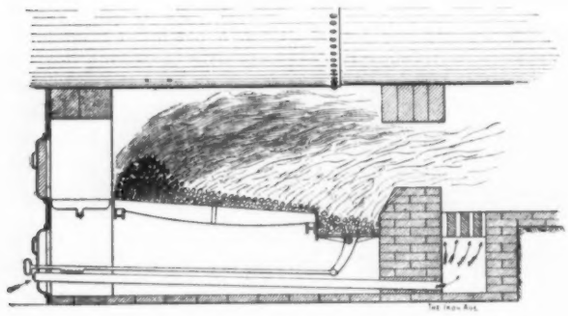


Fig. 2.—Dumping Grate at Rear of Furnace.

For properly charging the coal at the front of the furnace the furnace doors must also be kept open for some little time, but a device patented in 1894 was invented to overcome this objection. It is shown in Fig. 3. By this device it will be seen that the coal is first charged into a hopper over the firing door, and after the previous charge of coal has been coked on the front of the grate and the coke then shoved back to the rear

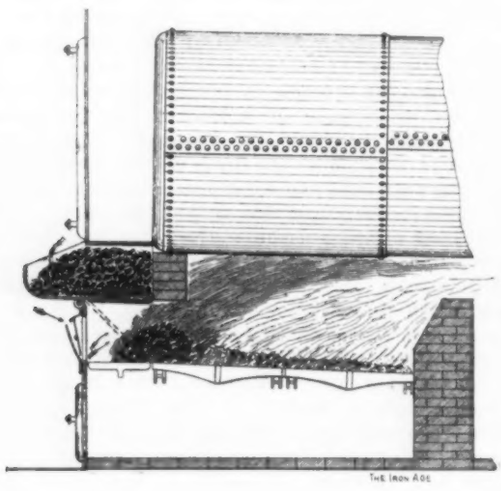


Fig. 3.—Dumping Device for Charging Coal at the Front of the Furnace.

of the furnace a lever is operated which dumps the contents of the hopper in the desired position. A similar device, somewhat less refined, was patented in England by Leigh in 1849, which consisted of a hopper placed over the frame of the firing door. A horizontal slide held the coal in the hopper, forming its bottom. When this slide was pulled out the coal dropped onto the dead plate below it. This device necessitated the projection of the framework carrying the fire and ash pit doors out into the boiler room.

There has been some controversy as to the best design for a coke firing grate, some claiming that the fresh coal should be charged on a regular grate bar, through which the air has free passage to penetrate the mass of fresh coal, while others claim that this fresh coal should be charged on a solid plate through which no air can pass, and some take a compromise position by allowing only a small amount of air opening through the coking plates. This matter of grate design depends largely upon the kind of coal used and the design of the balance of the furnace, and no invariable rule can be given to meet all conditions, each of the above claimants thus having equally good grounds on which to base their assumption.

In some designs for coke firing furnaces air is admitted above the fresh coal through openings in the side or front of the furnace walls (steam sometimes being used to inject it), while some others admit the required air through openings in the furnace door. There is no doubt but what some air thus admitted to the distilled gases is more or less desirable (as will be discussed later), but care must be taken not to allow it to chill these gases below their critical temperature of combustion.

As stated before, all bituminous coals are not adapted to this coking process of firing. Some fail to form a good coke, but crumble to an almost loose powdery form when heated, while others, carrying considerable sulphur and fusible ash, form a troublesome slag in the rear of the furnace, and soon cut down the required supply of air, besides increasing the time required for cleaning fires.

The ordinary plain settings of certain water tube and vertical fire tube boilers, in which the furnace gases pass directly upward from the fire bed, are not well adapted for this coke method of firing, since the gases arising from the coal should pass over the highly heated bed of coke toward the rear of the furnace, but this difficulty can be overcome by changing the setting so as to include an external or internal brick arch extending over the fire bed.

The horizontal tubular boiler and others with a long horizontal run of gases with their ordinary settings are more particularly adapted to coke firing.

The reader will note that considerable space has been devoted to the consideration of this coking method of firing. The extreme importance of this branch of our subject will be found in the fact that a majority of the smoke suppressing furnaces on the market depend upon this principle of firing for their smokeless operations, and for those called upon to pass on the merits of special furnaces a clear understanding of coking firing methods is most necessary.

Among such automatic stokers we find inclined grate stokers, chain grate stokers, revolving grate stokers and the horizontal moving grate bar stokers, while the underfed and down draft furnaces also depend upon coking their coal before burning it on the grate bars.

Alternate Firing.

Our second method of firing to obtain "smokeless" results, as stated above, is called "alternate firing," and it will be seen that it is less restricted in its application to special kinds of furnace construction than is the coke method of firing. It should, however, have an ample combustion chamber provided to mix the gases in various stages of combustion with the air (whether this combustion chamber be made a part of the fire box chamber or not).

For sake of simplifying our description, let us suppose that our furnace has two firing doors, and let us assume that the fuel on the grate has distilled off most of the volatile matter from the coal, reducing it to a bed of incandescent coke.

We begin by firing through one door and cover lightly one-half of our fire bed from front to rear with fresh coal. This will, of course, chill down the temperature of this half of our furnace and also fill up, more or less, the open spaces between the particles of coke, and thus stop off the free flow of air through the grates and fuel bed. This reduction of furnace temperature would be followed by the production of smoke were it not for the fact that the other half of the fire bed is maintaining a very high temperature, sufficient to keep the total furnace temperature up to a degree above the critical temperature of combustion, and besides admitting an excess of highly heated air through its porous coke bed.

When this recently fired half of our furnace has distilled off its volatile matter and its coke has approached a state of incandescence we are ready to place our next charge of fresh coal on the opposite half of our fire bed, and so we continue thus firing alternately on one side of our furnace and then on the opposite side, which system of operation gives this method its name of "alternate firing."

With alternate firing on plain grates we find that we have reduced somewhat the labor of cleaning fires (as compared with the coke firing system). In alternate firing coal should be charged in no greater amounts than will be just sufficient to cover lightly the one-half of the fire bed—say, from three to five shovels at a time.

When some begin firing by this method they will put so much coal on the fire at one charge that it will almost completely stop the combustion of the coke beneath it (due to the absorption of so much heat and the stopping of the air supply), and when they come to break up the fire bed there is still a large percentage of fresh unconsumed coal in the mass, which will give off a great volume of smoky gas and form a new crust, and thus the fireman will be in constant trouble. With an intelligent fireman such trouble will not continue long, and he will soon find this system of firing even easier than the common "go it as you please" method.

With alternate firing it is most essential that the hydrocarbon gases distilled from the fresh coal be thoroughly mixed with the excess of hot air (passing through the incandescent coke, on the other half of the furnace) to secure the best results, and what is known as a wing wall furnace has been designed to secure this result.

This furnace (patented in 1901), which is shown in Fig. 4, passes its gases over a horizontal bridge wall at the rear of the fire chamber (as water runs over a dam), and the gases are next brought together from each side of the furnace (*i. e.*, from the freshly fired half and the incandescent coke half, with its supply of hot air), and they are then made to pass through a vertical opening between the two "wing walls," where a mixing of air and gases takes place, thus greatly facilitating a thorough combustion.

The brick arch over the fire bed and the other walls in the path of the burning gases aid materially in maintaining high furnace temperatures, but this branch of our subject will be considered later.

A furnace which might be regarded as a compromise between a coke method and an alternate method firing device, which has been used in Germany and other parts of Europe for the past ten years, is shown in Fig. 5.

In this furnace coal is delivered to the fire bed from a long tube, K, the upper half of which is cut away for a distance equal to the length of the furnace. Let us suppose that this tube is entirely withdrawn from the furnace and filled with coal. Let us further suppose that the grates are covered with an incandescent bed of coke. By pressing the open end of the tube against the upper central door this door is opened by the separation of its right and left halves, which are hung on a central pivot (located immediately over the center of the door), and then the tube is shoved into the furnace its entire length, the flange on its outer end finally closing completely the door opening.

It will be seen that the grate has its surface inclined from the center downward in both directions, like an inverted V, thus increasing its area. By turning the lever on the outer end of the charging tube in one direction the fresh coal is slowly dumped the entire length of the furnace on the right side of the grate, and then the tube is removed for a new charge of coal, the door closing automatically. After the first charge of fresh coal has become coked the new charge of coal is introduced and dumped on the left side of the grate in a similar manner, followed by the removal of the charging tube. It is claimed that most of the fresh coal, when dumped, remains either on top of the central high part of this grate bar or not far from the center, and in this way it resembles the coking method of firing, with the incandescent coke below it on the same side of the grate. Charging fresh coal first on one side and then on the other gives us the advantages of the alternate method of firing.

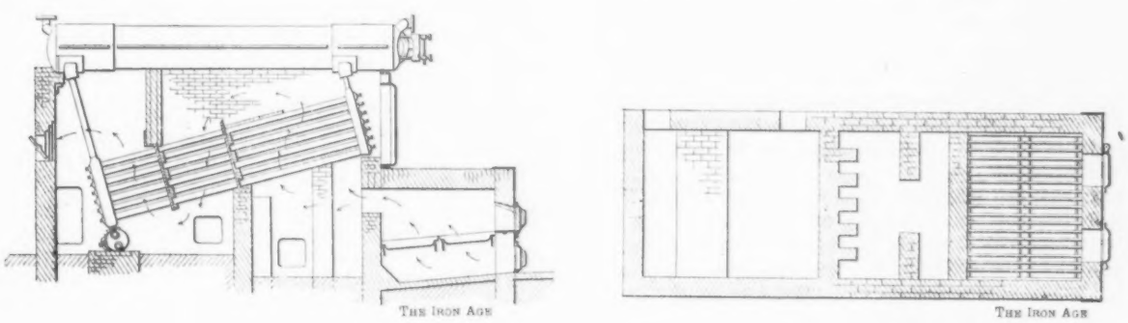


Fig. 4.—Elevation and Plan of Wing Wall Furnace.

The inner end of the charging tube is so constructed as to break up and shove aside any fuel it may find on its bearing when introduced. The fuel bed is broken up and the fire cleaned through two doors located on either side of the central charging door and on a level with the lower part of the grates. The grates are supported on air tubes, E E E, through which a supply of heated air is delivered behind the bridge wall.

Spread Firing.

The third method of hand firing, as stated above, is commonly termed "spread firing," but might better be called a "sprinkling system." It is by far less desirable from either a smoke suppressing or an economical stand-

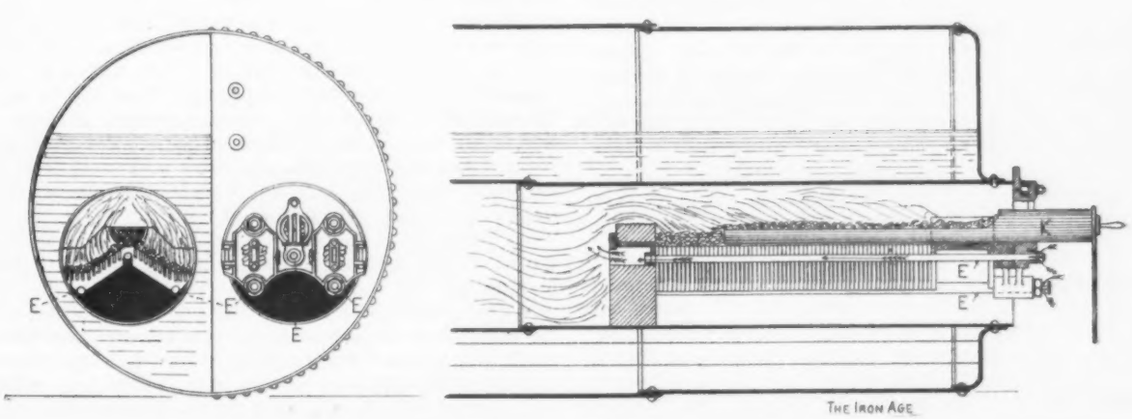


Fig. 5.—Compromise Between a Coke Method and an Alternate Method Firing Device.

point than either of the systems just described, and to obtain satisfactory results much more skill and constant attention are required on the part of the fireman.

By this system the fresh coal is scattered evenly over the entire fire bed in small light charges and at frequent intervals (say, every three to ten minutes), the character of the coal and the demand for steam determining this time and the quantity of coal used for each charge.

The deposit of a large quantity of coal in any place on the fire bed must be most carefully avoided, as such practice has an instantaneous chilling effect and clogs the free air opening through the fuel, so as to produce smoke and waste of fuel.

In this system of firing the fireman must keep a good level bed of fuel in the center of his furnace, with a somewhat greater thickness around his side and bridge walls, thus forming a flat, saucer like appearance.

He must keep his fire very clean and not allow it to become too thick, as plenty of air must pass through this bed and leave it at a high temperature to combine with the volatile matter, which is distilled off very rapidly from the fresh coal. He must constantly watch most carefully for holes in his fuel bed and around his side walls, which are constantly appearing in this system of firing, and he must fill them with light charges of fresh coal. Such cold rushing air will check combustion and produce smoke and waste.

I have seen some firemen obtain excellent results by following this system of firing, but such firemen are exceptional, and a little carelessness will be more productive of trouble than will result from an equal amount of carelessness with either of the other systems of firing.

One of the great objections in using this system of firing is due to the number of times the furnace door has to be opened, thus admitting excessive quantities of cold outside air.

This may be overcome to a considerable extent by using a light balanced damper at the flue opening out of the boiler, which will be closed and opened automatically as the furnace door is opened or closed.

The writer has designed and used such a device to excellent advantage, and found that it pays well to apply such an arrangement to most boilers, irrespective of the method of firing used.

Large Contracts for Railroad Equipment.

Last week at Pittsburgh the Pittsburgh & Lake Erie Railroad placed contracts for equipment which will aggregate nearly $2,500,000. This railroad runs from Pittsburgh to Youngstown, a distance of 68 miles. It is a three-track system all of the way and four-track part of the way, but it is the intention to make it four-track its full length. The road has had a remarkably prosperous career, and hauls millions of tons of coal and coke to the furnaces, rolling mills and steel plants located in the Mahoning and Shenango valleys. The par value of the stock is $50, but it has sold as high as $300 a share. The equipment that the road has contracted for consists of 1000 50-ton steel cars, to be built by the Standard Steel Car Company of Butler, Pa.; 30 consolidated freight engines and five Atlantic type passenger engines, to be built by the Pittsburgh Works of the American Locomotive Company; 10 passenger coaches, to be built by the American Car & Foundry Company, and 15,000 tons steel rails, to be rolled at the Edgar Thomson Works of the Carnegie Steel Company. Before the end of the year cabooses and general supplies, which will aggregate nearly an additional $1,000,000, will be contracted for. It is stated that after the new cars and engines are delivered the Pittsburgh & Lake Erie Railroad and the Erie Railroad will put in effect a three-hour schedule between Pittsburgh and Cleveland.

Peat Gas for Steel Making.—Peat gas, according to J. G. Thaulow in the *Teknisk Ugeblad*, has been employed as fuel at the Motala Steel Works, Sweden, for the past 30 years, originally for the puddling furnaces, and to a still greater extent, subsequently, for the open hearth furnaces. The peat is obtained chiefly from the further side of Lake Wetter, across which it is brought in sailing vessels and unloaded direct into large storehouses, whence it is taken by rail to the gas producers. The yearly consumption is from 13,000 to 16,000 cubic yards of dry kneaded peat, costing about 75 cents per cubic yard delivered at Motala. Two large gas producers are used, from which the gas is led to the open hearth furnaces through a condenser designed for ridding it of some of its moisture. Although the peat gas, owing to the distance the peat has to be brought, is dearer than coal gas, it is used preferably in most Swedish steel works because of the insignificant amount of sulphur and phosphorus it contains. In the rolling mills there is a smaller peat gas producer for one of the plate furnaces, and it is especially noted that thin steel plates scale less in rolling when the furnace is fired with peat gas.

Worcester Manufacturing News.

WORCESTER, MASS., October 13, 1902.—The new Standard Plunger Elevator Company will build their Worcester plant at Jamesville, a suburb of the city. The company have been given free of charge a tract of land containing more than 200,000 square feet, with a frontage of 400 feet on the Boston & Albany Division of the New York Central system. The donors are D. H. Eames, a local merchant, and W. B. James, a member of the family for whom the village is named. The new plant will be about 3 miles from Worcester City Hall, and is within a stone's throw of a new and up to date electric street railway and of the passenger station of the Boston & Albany Railroad.

The Standard Plunger Elevator Company are incorporated under the laws of Delaware, with an authorized capital stock of $6,000,000, of which $300,000 has been paid in. There is plenty of money back of the enterprise. The new hydraulic valve and other new features which the company will embody in their elevators have appealed to investors. The stock has all been sold by private subscription, most of it to New York capitalists.

The officers of the new company are: President, William H. Woodin of New York; secretary and general manager, Fred. A. Jones of Worcester; treasurer, John Sherman Hoyt of New York; chief engineer, Thure Larsson of Worcester; general superintendent, W. A. Waterman of Worcester. These gentlemen, with W. E. D. Stokes of New York, constitute the Board of Directors. The practical end of the business will be in most experienced hands. Mr. Jones, the secretary and general manager, has been for years the sales agent for the Plunger Elevator Company of Worcester, now controlled by the Otis Elevator Company, known as the elevator trust. Mr. Waterman has been for some years general foreman of the Plunger shops at Barbers Crossing. Mr. Larsson has been the Plunger Company's chief designer. Matthias B. Walls, who will have charge of the outside work with the title of erecting engineer, has occupied a similar position with the Plunger Company for a long time, and previously was head of the machine shop of the Washburn shops of the Worcester Polytechnic Institute. He went from the Washburn shops when the Plunger Company were organized and bought out the elevator business conducted as part of the institute's course in practical machine work.

Plans for the plant are completed, and the contract will be awarded within a day or two. The main shop will be 150 x 350 feet, and will be all in one room, with monitor roof 50 feet above the floor. Wood will be used throughout in the construction on a granite foundation and brick wall 3 feet in hight. The monitor roof will cover a space 60 feet wide, and there will be 45 feet under each wing. The large windows will be placed close together to give the maximum of light.

At the front of the building, on the end next the Boston & Albany Railroad tracks, will be a tower 104 feet high and 10 feet square, with pointed roof. An elevator will run in the tower for the purpose of exhibition and for testing and experimenting. This elevator will lift a car 7 feet square, with a run of 72 feet, to a door entering upon a balcony near the top of the tower from which a fine view will be obtained of the surrounding hilly country which is very attractive. The elevator will also

provide means of lifting parts of machinery 7 feet to the loading scaffold by which a spur track will run. Heavier parts will be raised by means of a traveling electric crane which will cover the entire length of the building and have a 50-foot span. The crane will have a lift of 30 feet. In addition to the main building there will be a power house 30 x 80 feet, divided into two rooms of equal size for boiler and engine rooms. Probably the blacksmith shop will be located outside of the main building, and the offices will be in a separate building.

The company have ordered a good deal of machinery. The 250 horse-power engine is from the Rice & Sargent Company of Providence, R. I. The boilers have not been ordered, but they probably will be from a Worcester concern, the policy of the new company being to patronize home industries as far as possible. The F. E. Reed Company have the order for 18 engine lathes, several of them 24 x 30 feet, and all of them heavy machines. The Woodward & Powell Planer Company have the order for two big planers. The Witherby, Rugg & Richardson Company of Worcester have the order for the wood working machinery. The drills are from the Cincinnati Drill Company of Cincinnati, Ohio, the milling machines from the Cincinnati Milling Machine Company, a boring mill from H. Bickford, Lakeport, N. H., and a punch from the Perkins Punch Company of Boston. The traveling crane is ordered from the Shaw Electric Crane Company of Muskegon, Mich. It is planned to drive all machinery electrically when it is practicable.

The contract for the buildings calls for the immediate beginning of operations, for the shop must be doing business in December in order to fill contracts already made for elevators, amounting in all to $500,000, as has been indicated in the New York machinery market report in *The Iron Age*. The new company have no connection with the Otis Elevator Company.

Jamesville lies at the extreme opposite end of the city from Barbers Crossing where the plant of the original Plunger Elevator Company is located. Jamesville has not been developed for manufacturing purposes, and this is looked upon as a beginning of great things, for the neighborhood has a large number of other excellent manufacturing sites along the Boston & Albany Railroad.

Water Power Development at Barre.

Plans are on foot to develop a great water power at Barre, Mass., and to establish a big plant for the generation of electricity for power. Barre is less than 20 miles from the city of Worcester, and is as near other large manufacturing cities and towns. It is believed that from 6000 to 10,000 horse-power can be developed, which can be readily sold after transmission by means of high potential currents and rotary transformer stations. Brown & McLain, electrical engineers of Boston, are interested in the project. Smith, Ludden & Ludden of Boston represent, as counsel, a syndicate with several millions of capital, who are considering the proposition. According to the engineers' plans an outlay of $100,000 will develop 1500 horse-power, this cost including turbine water wheels and electrical equipment, but not the copper for carrying the current to distant points. This power is possible without additional flowage. In addition, a syndicate of manufacturers using the water of the river control 3200 acres of land which may be flowed, and the nature of the land would make this possible at a minimum expense because the only dam required would be across a narrow ravine like valley. Several power stations would be necessary, the plan being to connect them with some central station. In the face of the present coal situation manufacturers of Central Massachusetts are casting about with a view to ascertaining what water power facilities are available. The Consolidated Street Railway is running one of its power stations without the use of a pound of coal, one privilege giving 600 horse-power, and this is an object lesson that is attracting considerable attention.

General Notes.

The coal situation in Worcester, so far as the manufacturers are concerned, is less threatening than it was a week ago. Soft coal is arriving in considerable quantities, and in addition large quantities of Welsh coal are on the way across the sea. The Consolidated Street Railway have one cargo of 7500 tons of this coal due to arrive in Boston October 20, and 3000 tons of it have been sold to a citizens' committee for the good of the poorer people, who will get it at $6.85 a ton on the cars in Worcester. Some of the manufacturers are experimenting with fuel oil under their boilers, several of them with success, it is said.

The Washburn & Moen Department of the American Steel & Wire Company have bought a large quantity of Welsh coal, which it will sell to their employees at cost.

The Thomaston Face & Ornamental Brick Company of Thomaston, Maine, have placed large orders for machinery in and about Worcester. The Slater Engine Company of Warren, Mass., get the order for a 600 horse-power engine, the Warren Steam Pump Company for an improved pump, and the Stewart Boiler Works of Worcester for the boilers for the power station.

The coremakers' strike continues at the shops of the Rice, Barton & Fales Machine & Iron Company. The unusual spectacle is presented of a foundry with one coremaker at work being picketed by four strikers. The company are suffering nothing by the strike, no work being held up in consequence.

The A. Burlingame Company, engine builders, are making extensive alterations at their plant on Cypress street made necessary by a recent fire which did considerable damage. Mill construction is being put in and the shops promise to be much better than before the fire. The company are doing a good business in small engines, and several of larger type are ordered.

The copperas plant of the Washburn & Moen Department of the American Steel & Wire Company has started up and is now manufacturing commercially, although the new processes which are applied in producing new shades of Venetian reds and a finer quality of this dye stuff are still being experimented with. While the capacity of the new plant is not much larger than the old one because it is limited by the amount of sulphate of iron recovered as a by-product in wire manufacture, the importance of the plant will be augmented by the greatly increased money value of the products.

Virginia Iron, Coal and Coke Company.

President Grant B. Schley of the Virginia Iron, Coal & Coke Company has resigned and Henry K. McHarg has been chosen to succeed him. Mr. McHarg, as one of the receivers of the company, has been in charge of affairs for about two years, and under his direction the plans to rehabilitate the company which are now being carried out were formulated. Of the 10 per cent. back interest which was due on the bonds 7½ per cent. has been paid off in cash and the remaining coupon is to be funded by an issue of 5 per cent, script, as is to be the case also with one of the coupons which fall due in 1903.

While the readjustment of the company's finances are now practically completed it is not likely that the receivers will be discharged before the beginning of next January. The favorable conditions which have existed in the iron trade have brought large profits to the Virginia Iron, Coal & Coke Company, and their earnings during the present year have been at the rate of about $100,000 a month—exclusive of the earnings of the Virginia & Southwestern Railroad Company, owned by the Iron & Coal Company. The bonded debt of the company as readjusted will amount to a little less than $8,000,000, requiring an annual interest payment of about $400,000. The balance of $800,000 amounts to more than 9 per cent. earned on the stock for the present year.

Mr. McHarg has also been made president of the Virginia & Southwestern Railroad.

The Chicago Pneumatic Tool Company report that owing to the vast amount of business they are receiving from the Southwest they have deemed it advisable to again place a representative in that district and therefore have located W. C. Walker in St. Louis, with headquarters at 325 Lincoln Trust Building. They believe this arrangement will greatly facilitate handling the volume of business received from that territory and will be very advantageous to both themselves and their numerous customers.

The White Power and Speed Regulating Device.

The White speed regulator is practically unlimited in its range of speeds, as it may be designed to secure any variation which practice may demand. It is provided with a spring regulated tension which acts as a safety governor, and an automatic speed indicator which makes it possible for the operator to always know at what speed his machine is running.

The construction of the device, which is made by the Power & Speed Regulator Mfg. Company, Limited, of Kalamazoo, Mich., will be understood from the drawings here presented. Four different applications of the regulator are shown, in all of which the same principle is involved. In each illustration there are two cones, over which passes the driving belt, and which are arranged parallel with each other or at right angles, according to the relative position of the main driving shaft and the machine to be driven. In the first drawing the two cones A, F, have their axes parallel. The endless belt passes over these cones and also over the spring tension device B. The shaft A is driven by one or the other of the clutches D. Change of speed is effected by shifting the belt along the cones by means of the lever C.

In the second drawing the cones are mounted upon the same shaft, the speed changing device being placed above, as in the first case. This particular form may be applied direct to the machine itself, and when attached to an automobile the large end of the cone J is formed as an idle pulley.

In the third drawing the cones are again parallel, but the belt is shifted by the rack and pinion C. Power is applied at E on the shaft A, the tight and loose pulleys D being on the shaft B.

In the last engraving the cones A and B are at right angles. The belt is shifted by the hand wheel D, which moves the idle pulleys along the guide frame C. Power is transmitted by the pulleys F and E.

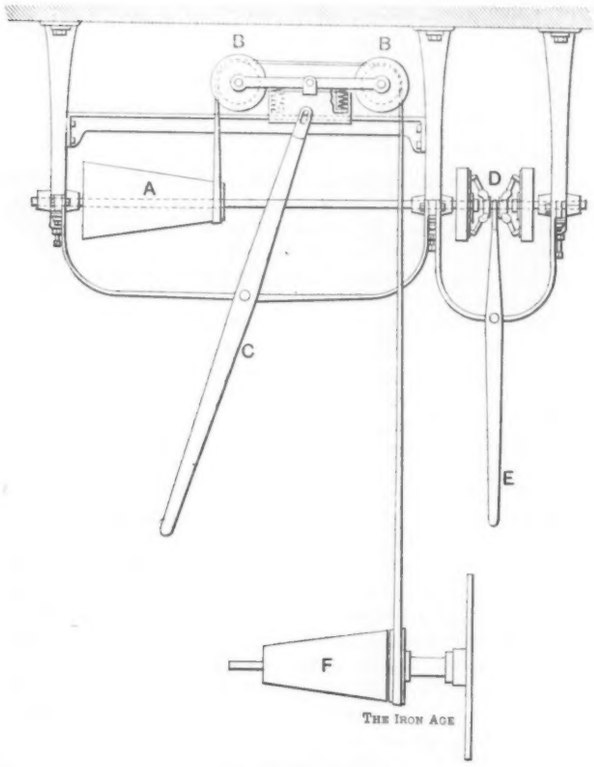


Fig. 1.—Cones Parallel.

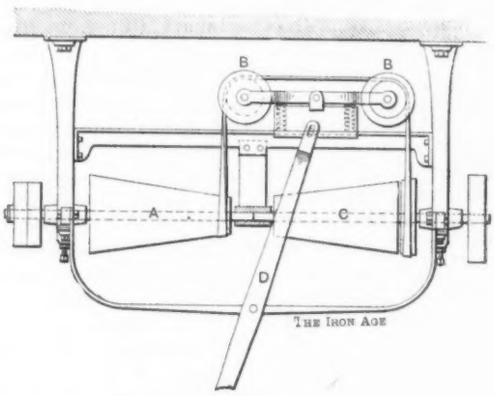


Fig. 2.—Cones Parallel.

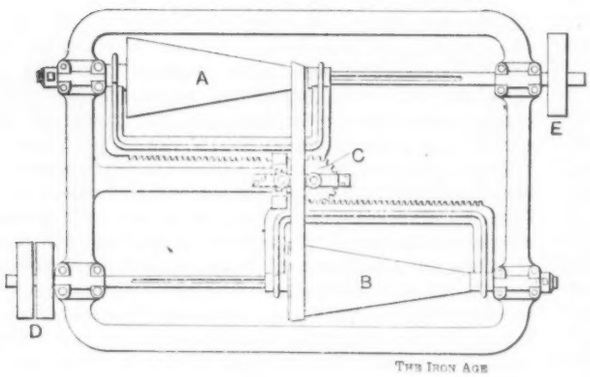


Fig. 3.—Belt Operated by Rack and Pinion.

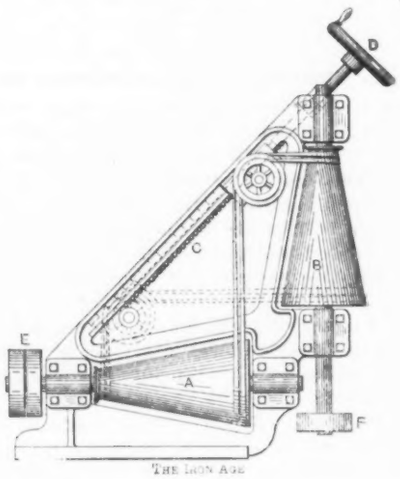


Fig. 4.—Cones at Right Angles.

THE WHITE POWER AND SPEED REGULATING DEVICE.

Canadian News.

Scarcity of Coal.

TORONTO, CANADA, October 11, 1902.—Besides the great unsatisfied demand for coal on household account, there is a large deficit beginning to yawn in the supply for industrial use. Many of the manufacturers have got close to the end of their stock, and do not see where replenishment is coming from unless the offerings become freer and prices decline. Canada has large deposits of good steam coal, but the part of the country in which manufacturing industry has expanded most is furthest from the domestic coal fields. Ontario's works of all kinds are operated by power produced from American coal. The province is tributary to the coal fields of Ohio and Pennsylvania. It is cut off from the coal deposits of Nova Scotia and British Columbia by the excessive cost of transportation. It should soon be possible, however, to lay down Nova Scotia coal at a price not less favorable to consumers than that at which Ohio coal is delivered here. Both the Dominion Coal Com-

pany and the Nova Scotia Steel & Coal Company are heavy shippers of coal to the St. Lawrence ports, but they have not sold any further west than Montreal. A few days ago Mayor Howland of Toronto communicated with the Dominion Coal Company to learn at what price they could deliver supplies in this city for household and manufacturing purposes. He was told in reply that the company had none of their output for sale in this market. This provoked the Mayor to some strong statements to the effect that the Dominion Coal Company were in combination with the American coal producers, as if a partition of territory had been agreed upon between them. To this Mr. Shields, general manager of the Dominion Coal Company, replied in a published interview, denying the accusation and stating that the company could not at once increase their output to the limit required for meeting the extra demand from Ontario, and that Ontario was placed out of reach by the high freight charges. He added that if the canals were deepened to 20 feet the company could ship coal to Toronto. Two years ago the work of deepening the canals from a minimum of 8 or 9 feet to a uniform 14 feet was completed, and everybody expected that Nova Scotia coal would at once come up to the lakes.

Notwithstanding the statement made by Mr. Shields, the question of bringing in coal from Nova Scotia is keenly discussed. This is for the reason that the Dominion Company are by no means the only producers. There are the Nova Scotia Steel & Coal Company, with splendid deposits at Sydney Mines, Cape Breton, and several other companies. Altogether there are 18 companies in the field. It is proposed that the Dominion Government, which operates the International Railway for the people of Canada, make a specially low freight rate on coal from Nova Scotia to interior points. It has also been strongly urged, even by Opposition newspapers, that the Government come to the relief of industry by temporarily suspending the duty on soft coal.

Soft coal, of which 3,135,158 tons were imported in 1901, is subject to a duty of 53 cents per ton. The duty on slack coal amounts to 21 cents per ton. It is calculated this way: On 20 per cent. of any shipment of bituminous coal the full duty of 53 cents a ton is charged, while on the remaining 80 per cent. a 20 per cent. ad valorem rate is charged, the value for duty purposes being the price at the mine. Should the value at the mine be so high that the combined duties would exceed 21 cents per ton, then 20 per cent. of the shipment pays, as before, 53 cents per ton, and on the remaining 80 per cent. the charge is reduced to 13 cents a ton, which gives the same result as before—namely, 21 cents per ton. Thus, 100 tons sold at 65 cents at the mine amounts to $65. Twenty per cent. of this quantity—that is, 20 tons—pays 53 cents per ton, or $10.60 in duty. The remaining 80 per cent. of the quantity—that is, 80 tons—amounts at 65 cents to $52. A duty of 20 per cent. on this value is $10.40. So the total duty on the 100 tons is $10.60 + $10.40 = $21, or 21 cents per ton. Should the value at the mine be less than 65 cents there would be a trifling saving, but where it is higher the duty is calculated thus: Twenty per cent. of the 100-ton shipment pays a duty of 53 cents per ton—that is, $10.60; 80 per cent. of the 100 tons pays a duty of 13 cents per ton, or $10.40; total, $21—that is, 21 cents per ton.

Canada's Coal Fields.

In 1900 the output of the British Columbia coal mines amounted to 1,590,179 tons. Of this quantity, 1,383,375 tons came from the Vancouver Island collieries, the remainder coming from the Crow's Nest Pass mines. By far the larger part of the British Columbia coal is sold in California, the Hawaiian Islands, Alaska, and to the China and Australian steamships. In 1900 California took 766,917 tons. The Nanaimo, the Wellington, the Union and the Alexandria are the great collieries of Vancouver Island. A hard bituminous coal, of high grade both for steam and cooking purposes, is yielded by these mines. At Nanaimo the principal mine is directly on the shore, and the galleries are pushed out far under the water, so that, as in Cape Breton, vessels may load with coal that is extracted directly beneath them.

J. McEvoy, an official of the Geological Survey, made a report on the Crow's Nest coal fields in the Rocky Mountains, which he explored for the purpose in 1900. He estimated the extent of the coal area there at 230 square miles, or 147,200 acres. He calculated the yield per acre on a conservative estimate at 153,480 tons of 2240 pounds, and the total contents of the mines at 22,595,200,000 tons. This is far below the estimate of 75,000,000,000 tons made some years before by Dr. Selwyn, Director of the Geological Survey. Analyses made by the Geological Survey show from 67 to 69 per cent. of fixed carbon, and much higher percentages have been shown by nonofficial analyses of other specimens. A coke carrying 94 per cent. of carbon has been made from Crow's Nest coal. A vein from the Crow's Nest coal field extends into Alberta. Upon this extension a great deal of prospecting has been done by the British America Coal Company.

In other parts of British Columbia there are promising fields. A deposit, of which analyzed samples showed nearly 63 per cent. of fixed carbon, was discovered a few years ago in Nicola Valley. It is reported to be of good steam quality and is believed to be of large extent. In the Similkameen Valley another bed has been found. In Southern Cassiar several locations were made in 1900. On the west coast of Vancouver Island, on Quatsino Sound, new fields have been discovered. A company were organized in England two years ago to prospect for coal in the neighborhood of Kamloops, where the late Dr. Dawson, Director of the Geological Survey, indicated that an extensive body would be found.

Besides the spur projecting from the Crow's Nest Pass into Alberta, there are other coal fields in the Northwest Territories. Other mines in Alberta are those at Lethbridge, Anthracite, Canmore and Edmonton. Further east are the Souris mines. About half the total production is taken by the Canadian Pacific Railway. The anthracite near Banff has been pronounced equal to the best Pennsylvania coal. An almost smokeless coal is that produced at Canmore. It was estimated by Dr. Dawson that the coal measures stretching from Lethbridge along the international border to Manitoba covered 15,000 square miles. In the Yukon district are numerous lignite areas, yielding a fuel containing 40 per cent. of fixed carbon.

Nova Scotia is the great coal producing province of Canada. In 1901 the Dominion Coal Company raised 2,561,783 tons from their Cape Breton mines. Of this quantity 863,633 tons were delivered at St. Lawrence ports, and about 600,000 tons exported to the United States. Altogether in 1901 there were produced in Nova Scotia 3,800,000 tons of coal. In the counties of Inverness, Pictou and Cumberland coal is freely produced. The Dominion Coal Company hold their mines under a lease from the Provincial Government, to which the company pay a royalty. Formerly all the coal lands of the province belonged to the Duke of York, to whom they were granted by an act of the royal prerogative by William IV. In 1826 the Duke leased the lands to the General Mining Association. This lease called for the payment to the Duke of a royalty of 1 shilling per ton on all the coal mined. Active mining was begun in 1830. In 1857 the Duke of York's lease was surrendered, and the mines, now operated by the Dominion Coal Company, became the property of the colony. But the General Mining Association—a British corporation—retained the deposits at Sydney Mines, which about two years ago they sold to the Nova Scotia Steel & Coal Company.

C. A. C. J.

Edgar T. Ward & Sons, 23 and 25 Purchase street, Boston, have erected a brick building, 80 x 100 feet, on Pittsburgh street, South Boston, for wholesale shipment and storage purposes for their stock of shafting, cold rolled steel and tool steel.

Charles H. Morgan, president of the Morgan Construction Company, Morgan Spring Company and Morgan Motor Company, Worcester, Mass., has returned from a European trip, made chiefly for the purpose of visiting the machinery exhibition at Düsseldorf, Germany.

The Iron Age

New York, Thursday, October 16, 1902.

DAVID WILLIAMS COMPANY, - - - - - - - - PUBLISHERS.
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GEO. W. COPE, - - - - - - - - - - ASSOCIATE EDITOR.
RICHARD R. WILLIAMS, - - - - - - - - - HARDWARE EDITOR.
JOHN S. KING, - - - - - - - - - - BUSINESS MANAGER.

Cost of Production Increasing.

Manufacturers of iron and steel products who do not control the supply of their raw material are finding the cost of production increasing heavily. Various causes have operated to bring about a great change in this respect from the conditions prevailing before the revival of business activity in 1898. We were then suffering from a surplus of everything entering into the production of manufactured goods. Our facilities for mining ore and coal, for making coke and for converting raw materials into finished products were much in excess of home requirements. Labor was more than abundant, and artisans who had migrated hither from Europe were returning to their old homes in search of employment. Transportation facilities were so much in advance of the apparent needs of the country that the most important railroad systems were soliciting the business of small shippers, sharply competing for any traffic in sight. All essential elements in producing manufactured goods were so cheap that costs in this country fell below the level then ruling abroad, and the cultivation of an iron and steel export trade was a comparatively simple matter. If quality or superiority could not win the favor of a foreign buyer, prices were made which he could not afford to overlook. While the fact was plainly apparent that domestic consumption was much under its normal rate, yet the margin between the estimate of that rate and the great producing capacity of the country seemed so large that it was the common belief, even among the most astute business men, that we had entered upon an era of permanent cheapness. In their opinion a complete revolution had taken place and the United States would never again be known as a country of high prices.

A comparatively short time has sufficed to bring about a complete transformation. One of the striking features of the business history of the United States is that the recuperative energy of the people, following a period of depression, has never been more than faintly comprehended. Here and there an enthusiastic optimist has been found at such a time predicting unprecedented prosperity for a number of years, but the masses have been skeptical. While the memory of a business depression is fresh in their minds they do not permit themselves to believe that the past has gone with all its woes and a new set of conditions must be as seriously dealt with as if they were permanent. We are now passing through such an experience. Several times, since the present period of activity set in, the apex seemed to have been reached, but every period of hesitation or quiet trade was only a breathing spell, to be succeeded by a fresh outburst of buying which has forced average prices still higher and swollen the volume of business to much greater proportions. The developments of the current period of reawakened energy have thus surpassed all expectations. They have demonstrated that the country's domestic requirements have so heavily expanded as to exceed present facilities in lines which it had not been thought possible to overtax. The consumption of iron and its products is so much in excess of the capacity of our blast furnaces and steel works that even if no miners' strike had diminished the supply of fuel it would have been necessary to draw upon the resources of foreign manufacturers. Transportation facilities, despite lavish expenditures for rolling stock and track improvements, have proved seriously inadequate to meet the necessities of the times and traffic is badly congested at all important commercial centers. In addition to these influences the demand for labor, especially skilled labor, has long been so heavy that it is often a matter of great difficulty to man a new factory or to push a scheme of improvements requiring the speedy organization of a considerable force of workmen. In many branches of manufacturing industry the wages of skilled workmen have been advancing beyond union scales as a result of the great demand for more help.

A continuance of high cost of production into the coming year is indicated by contracts for raw materials which are now being made. Consumers of coke are placing orders at much higher prices than those ruling on this year's contracts. Much more than half of the output of merchant pig iron which will be turned out in the first six months of 1903 has already been sold at prices which are fully 50 per cent. above the average contract price on iron delivered in the past nine months. The coal miners' strikes have intensified the influences making for higher costs by cutting down the supply of fuel so seriously that, even if they are all speedily settled, coal of every kind will for months cost a great deal more in all Northern manufacturing localities than for many years. It will require considerable expansion in manufacturing and transportation facilities or a decided falling off in the consumption of iron and steel to reduce costs to anything like the level of 1898.

Professor Dewar on Technical Education.

Whether the constant animadversions of other peoples, or dissatisfaction with the showing of financial reports, has had an effect in awakening the English public to a sense of their position in the race for supremacy, whatever the cause may be, it is certain that a portion of their leading mentors recognize the necessity of stronger efforts to retain even their present status, and they embrace every favorable opportunity to urge their countrymen forward. Among these, Professor James Dewar, president of the British Association, is an earnest advocate, and in his address at the recent meeting of his associates he laid great stress upon the necessity of a better and truer technical education along all lines of arts, trades and professions. In the matter of industrial chemistry the professor laid emphasis upon the better equipment of German manufacturers, and said that notwithstanding the fact that there is a very important chemical industry in England, the works do not employ one-third of the staff that their competitors in Germany employ. He averred that the rule of thumb method still prevailed to a very great extent in England. It hardly needed to be pointed out that so-called chemists, who had never graduated from scientific schools, might be competent to carry on certain processes according to traditional methods, but they were not likely to effect substantial improvements or to invent newer and more efficient processes. Here and there were individuals whose intelligence enabled them to overcome defects of training, but in all educational matters it was the average man who had to be looked to, and average ability which had to be relied upon. The actual chemical operations carried

on in Germany, both quantitative and qualitative, are far greater than in England; they have existed for 70 years and expanded enormously in the last 30 years, and what is curious, they are very largely founded upon basic discoveries made by English chemists, but never appreciated or developed by their discoverers. As an instance of this Professor Dewar referred to the utilization of coal tar in the production of drugs, perfumery, color, dyes, &c. The fundamental principles of this industry were discovered in England, and were practically developed to a certain extent by their authors, but despite the abundance of raw material and the evidence that it was profitable and could be remuneratively worked, English chemists suffered the opportunity to pass into the hands of foreign competitors. The colors they made were extracted from British material and soon drove the English goods from the market. Professor Dewar says that the cause of this was want of education. English manufacturers had the raw material in abundance when other nations had comparatively little; they had capital, the brains, and originated the whole thing, but they lacked the diffused education to realize their opportunity, without which the ideas of men of genius bear no fruit beyond individual cases. The patent laws have been blamed for the passing of this great industry into other people's hands, but if they are defective the reason for it is again found in a want of education. Let them be worthless, for example; we have only proved that those who made them were misled by theories instead of being conversant with facts and logical deductions from a certain array of them. The root of the mischief is not in the patent laws, nor yet in legislation, but lies in the want of education in the so-called educated classes, and, secondarily, among the workmen upon whom the latter depend. The Germans have an abundance of men who are thoroughly trained and methodically directed, and it is to them that she owes her present pre-eminence.

The failure of English schools to turn out young men of this class and the apathy of manufacturers in demanding them explain the loss of many prominent industries in Great Britain and the feeble hold upon others, but let no one fancy that these lapses can be remedied by the so-called technical training which is now such a fashionable nostrum. In its way it is not without merit, but it must have its base in a foundation of general training or mental discipline. Mental habits are formed early in life, or long before men enter technical colleges; we must begin by training the young men to think correctly and logically, to deal with facts at the first hand and evolve, each for himself, the solution of a problem put before him, instead of learning by rote, as a solution made by some one else. Plenty of chemists are turned out by the universities who are chock full of theories and know text books by heart, but if we set before them an entirely new set of conditions which have arisen in the laboratory they are unable to cope with them, for their acquisitions run in grooves; they are floored by the unusual and unexpected. Those who escape coming to grief are men who have been taught to think long before they went to a university. Professor Dewar said that it is not at all surprising that German manufacturers have seized certain industries; the wonder is that they have not occupied more of them than they have, for through specialized courses they have reached a point of educational equipment that will take two generations to catch up with. Germany possesses a national weapon of precision that gives her an enormous initial advantage in any pursuit she may take up.

Referring to the endowments of institutions of learning by Andrew Carnegie, Professor Dewar said that he had made a transcript from the books of some to find out what education costs for a term of years. Taking salaries of professors and their assistants, together with laboratory equipment, for 100 years, it amounted to a little over $500,000. Contributions by legacies and other sources swelled the available sum, but the average amount expended annually in a century was about $6000, and his conclusion was that the man of exceptional ability was about the cheapest of natural products.

CORRESPONDENCE.

Special Export Prices.

To the Editor: Referring to the article in your paper of the 11th ult., on special export prices, it is therein stated that "A check upon unduly high home prices is furnished by the law, which allows articles of United States manufacture imported in the original packages to re-enter (your) country duty free."

We beg to inform you that all sales made on this side the Atlantic by the American Wire Company carry the condition: "Not to be reshipped either to the United States or Canada." Thus the intended protection to your home consumer is entirely defeated.

Regarding the export of goods "manufactured from imported raw material, under which 99 per cent. of the duty has been remitted under drawback, you remark as follows:

"It is quite clear that in such cases lower prices for foreign markets do not imply discrimination against the domestic consumer."

It will be evident that if the domestic consumer had an equal chance with the foreign buyer the domestic consumer would be able to enjoy all the advantages which the foreign buyer is now offered by your steel trusts.

C.

LONDON, October 3, 1902.

Variable Speed Machinery.

The Power & Speed Regulator Mfg. Company, Limited, Kalamazoo, Mich., organized for the manufacture of variable speed machinery, embodying the White speed regulator, also variable speed countershafts and power transmitters in all styles and sizes, have equipped a temporary plant to meet the present demand for their lines. The new machinery installed is from the shops of several prominent manufacturers and was furnished by the C. C. Wormer Machinery Company of Detroit. The manufacturing will be conducted at this plant until they can perfect plans, construct and equip a factory of their own.

The lines which will receive the company's first attention are, first, drill presses in all styles and sizes which the trade demands; second, variable speed countershafts or power transmitters of various styles to conform to the requirements in the different lines of practice and ranging in sizes from ⅛ horse-power up to any capacity desired. The variable speed countershaft or power transmitter is intended to be used as an attachment in combination with machines desired to be run at various speeds, and in practice is placed between the machine to be controlled and the driving power. With these variable speed transmitters on the market it makes it possible for parties having their plants equipped with old style machines to get the same service from them that they could from a modern machine which contained the speed regulating device by using the variable speed transmitter as an attachment in combination with their old machines.

Among the variable speed transmitters which they will first place upon the market will be machines especially intended to regulate the speed of printing presses and other machines of like character. Also a special construction intended for use in combination with automobiles to control their speed and determine the vantage position of their power to suit the conditions,

grades, sand, &c., of different roads. In new machines the power and speed regulating device will be included in the design, and in some special lines the company may decide to sell shop rights to parties wishing to apply it to variable speed machines which they may be engaged in manufacturing.

The officers are H. P. White, chairman; S. O. Bennett, secretary, and F. G. Dewey, treasurer.

Notes from Great Britain.

A New Commercial Phase.

LONDON, October 4, 1902.—Attention this week has been divided among the bargain the British Government has struck with the Cunard Company and the Morgan combine, the money market and the anthracite coal miners' strike in America. In this connection a new aspect of commercial statesmanship is observed which in many respects is novel and is certainly a fundamental divergence from established habits and rooted traditions. It cannot fail to have struck competent observers that the American Executive and the British Government have during the past few weeks stepped down from their official positions and directly concerned themselves with business affairs. President Roosevelt has not only made his pronouncement in regard to the trusts, in which he clearly foreshadows the necessity of some form of Government intervention and some degree of Government control, but he has endeavored to act as a go-between in the anthracite coal dispute. On our side the British Government, through its properly accredited Minister, the president of the Board of Trade, has gone a step further and has actually made a contract with two separate shipping concerns, both of which are a distinct advance upon all previous arrangements as between the Government and private traders. From now on it must be recognized that the British Government is an active working partner in the Atlantic transport trade.

If I interpret aright the general sentiment over here it is that the course the British Government has adopted has become inevitable in consequence of modern commercial developments. In days gone by every man was master of his own business; but now, so stupendous are the interests involved, so vital are they to the commercial well being of the community, so far beyond the capacity of private individual direction have they become, that the Government in defense of its own people must step in and insist upon certain conditions which in its opinion are necessary in the general interests of this nation.

Space precludes even vague reference to the hundred and one large implications which are carried in this new change of policy. One point which should not escape observation is that it is not peculiar to any one country. President Roosevelt has spoken the mind of the American Executive; the British Government, in its way and according to its circumstances, has also spoken. The German Government has long since become an active participant both in railway and shipping affairs, and it is no exaggeration to say that the fast German Atlantic liners are at the present moment plying their trade because they are backed by Government subventions—subventions for which, by the way, the private trader has to pay a big price. And now comes the question—and it is a vital one—Where is this new departure to carry us?

Signs are not wanting that the Atlantic shipping combine is but the first step toward the co-ordination of the whole world's transit system. Clearly the American railways must co-operate with the American combine, and if the English railways do not follow suit they must inevitably be prejudiced in many different ways. Already rumors are rife in this country that J. Pierpont Morgan has his eye upon the London & North Western and Great Western railway systems of this country. J. Pierpont Morgan is doubtless a financial Napoleon, but if he were to attempt to tackle either or both of these railway companies he would more than likely meet with a disastrous Waterloo. Still, rumor in this case merely gives words to logical thoughts which lie at the back of our brains.

Co-ordination of the world's transit, both on sea and land, will indubitably be accomplished in the lifetime of most of us. And the conclusion I draw is that this is impossible unless by far reaching agreements in which the various governments concerned must take a great deal more than a mere *laissez faire* part. The old idea was for the Government to stand by and see fair play; the new idea is for the Government to become a component part in commercial negotiations. When that becomes the usual thing the capital power lying behind all governments must inevitably submerge the private capitalist. The final thought and the chief danger of all this may be summed up in the question. In the new circumstances, by what means can we best develop the most highly competent and efficient commercial administrator?

The Atlantic Shipping Deal.

I now come to the actual arrangements entered into between the three parties—viz., the British Government, the Cunard Company and the Morgan combine. Doubtless the main outlines have already been cabled, but it may be well to give chapter and verse. The full particulars will be found, first, in a circular issued by the chairman of the Cunard Company to the shareholders, and, second, in a speech delivered by the president of the Board of Trade at the cutlers' feast in Sheffield on Tuesday, September 30. The terms set forth in the letter referred to by Lord Inverclyde, the chairman of the Cunard Company, are as follows:

1. The Cunard Company are to build two large steamers for the Atlantic trade of high speed.
2. The agreement is to remain in force for 20 years from the completion of the second of these vessels.
3. The Cunard Company pledge themselves until the expiry of the agreement to remain a purely British undertaking, and that under no circumstances shall the management of the company be in the hands of or the shares or the vessels of the company held by other than British subjects.
4. During the currency of the agreement the Cunard Company are to hold at the disposal of the Government the whole of their fleet, including the two new vessels and all other vessels as built, the Government being at liberty to charter or purchase all or any such vessels at agreed rates.
5. The Cunard Company also undertake not unduly to raise freights or to give any preferential rates to foreigners.

The Government is to lend the money for the construction of the two new vessels, charging interest at 2¾ per cent. per annum. The security for the loan is to be a first charge on the two new vessels, the present fleet, and the general assets of the Cunard Company.

7. The Cunard Company are to repay the loan by annual payments, extending over 20 years.
8. From the time new vessels commence to run the Government is to pay the Cunard Company at the rate of £150,000 per annum instead of the present Admiralty subvention.

In reference to Clause 3, as above, while no doubt the management can be retained in strictly British hands, it goes without saying that there is no legal power to prevent foreigners from becoming shareholders in the Cunard Company, either now or hereafter. The illegal nature of any such proviso is easily shown. To start with, a number of foreigners are at present stockholders in the concern. Clearly they cannot be compelled to part with their interest. Secondly, stock may be bequeathed by a father to a daughter. The daughter marries an American, and the son of the daughter inherits the property and is, of course, an American too. There are a number of other complications of this sort which cannot be avoided even if the articles of association are changed. In regard to the agreement with the Morgan combine I content myself with quoting the words used by Gerald Balfour, President of the Board of Trade. He said:

I have already indicated that it was not unnatural that the public should see in the Atlantic Shipping combine a design of injuring British shipping and British commerce. While I say that, I feel bound to add an expression of my firm conviction that no such design ever entered into the mind of Mr. Morgan. Mr. Pierpont Morgan is a great believer in the principle of trusts, and he also considers that the conditions of the Atlantic shipping trade were such as to make that principle peculiarly applicable. With true American decision he proceeded to apply it, but I am quite certain he had no intention whatever of injuring the commerce or the shipping of this country, and the proof is the readiness with which he has met the Government in all those points in respect of which British interests might seem

be most endangered by the fact that this shipping combination had been formed. We made an agreement with Mr. Morgan, and the general effect of it is to secure that the British companies in the combination shall remain British, that those companies shall be kept alive, and a majority at least of their directors shall always be British subjects. The agreement further provides that every ship now flying the British flag, and every ship hereafter built for the combination, shall continue to be a British ship, and shall continue to fly the British flag; that it shall be officered by British officers and manned in reasonable proportion by British crews. As regards future construction the combination has undertaken that at least half the tonnage hereafter built for the combination shall be built for the British companies and shall continue to fly the British flag and be in all respects British vessels. And a provision has further been added enabling His Majesty's Government, in the event—which I trust will not be realized—of the combination pursuing a policy hostile to the British mercantile marine or hostile to British trade, to terminate the agreement into which they have entered.

A good deal of interest will doubtless center around the building of the two fast liners. It is notorious, however, that they could have been built at any time. The British companies have hitherto declined to go beyond 22-knot boats on the ground that it was commercially unprofitable. The Germans have done so because the Government guarantee their dividend. The Cunard Company can now do so because the British Government is advancing to them a sum of money which is calculated to cover their probable loss. It is simple as A B C. The engineer provides the vessel; the Cunard Company run it, and the British Government pays the loss. I could run a big business myself on the same terms.

The Money Market.

One or two events this week call for notice. In the first place, the bank rate has been advanced to 4 per cent., with the avowed intention on the part of the governors of the bank to keep gold in this country. In the second place there is a distinct feeling of unrest just now in Europe, caused by hints of revolution in the Balkans. The Turkish Government has mobilized 300,000 men, and Russia and Austria are watching the situation like cats watching mice. Undoubtedly the position is fraught with danger and financial men are taking precautions. In addition there have been large withdrawals from French banks, and altogether the European situation is a little disquieting. But against this disquieting rumor has to be set the great fact that Russia's only interest just now is peace. M. de Witte, the power behind the throne, has let this be known in unmistakable terms. Further, the snow just now is settling thick on the Balkans and we may be more or less at ease until it melts.

The Coal and Iron Market.

The most prominent feature this week of the market has been the purchase by Americans of Welsh anthracite coal. One Cardiff firm has received an order from America for 15,000 tons of steam coal, and I heard yesterday that a prominent representative of the United States Steel Corporation had been in South Wales on a similar quest. The curious thing is that he is the last gentleman one would have expected to go on this errand.

In the iron trade the auditor's ascertainment shows a slightly advanced wage, but the average selling price has remained remarkably steady, and the output on the North Coast and in the Midlands, notwithstanding an extra holiday and the Coronation festivities, shows a slight increase. The tendency of the home market is toward dullness, if not actual stagnation. There is but little inquiry for finished iron and, indeed, the demand all round is flat. Nor do the engineering trades exhibit any encouraging signs of improvement. Iron manufacturers are endeavoring as best they can to maintain prices, which they justify on the grounds of high price of pig iron and extra wages. On the other hand the manufacturers of finished products complain bitterly and hold their hand. They buy as little as they possibly can. They certainly have been squeezed long enough. There has been during the past fortnight a distinct increase in the number of American orders. Down to three weeks or a month ago they showed distinct signs of slackening, but more recently larger orders have come to hand and of a more varied description.

Prices remain the same as those quoted last week. There have been some fluctuations in the pig iron market, but within narrow limits. Last Tuesday a large quantity of stock changed hands, amounting to between 40,000 and 50,000 tons, for the most part Cleveland warrants, and on behalf of Americans. It may be said broadly that what the pig iron market gains by American purchases it more than loses by incipient stagnation in the British market. S. G. H.

Briquette Making in Germany.

A report from Consul-General Frank H. Mason, at Berlin, contains much information regarding the manufacture of briquettes from brown coal, peat, coal dust, &c. At the close of 1900 there were in Germany 89 manufactories of fuel briquettes, some of which annually produce more than 100,000 tons each. The processes employed in France and Germany have long passed the experimental stage and become a standard commercial industry.

"If Americans," says Mr. Mason, "are really interested in the subject there is no need that they should risk any large sums of money in uncertain experiments. They have only to study the machinery and methods employed in European countries, compare their crude materials with those found and used here, and they can thus start at the point of technical knowledge which Europeans have reached after many years of experience. There are experienced engineers and a dozen manufacturers of briquette making machinery who would gladly co-operate in these tests, and would furnish machinery adapted to working the material. Upon a basis of such tests, plans and estimates could be obtained for the erection of plants in the United States with specified daily capacity."

Mr. Mason gives the names and addresses of a number of German firms engaged in the business. He says "that briquette works are divided in respect to the material employed into two general classes—viz.: Those which make briquettes from brown coal (lignite) or carbonized peat, with or without the addition of a bituminous matrix or binder, and, second, those which use as a basic material coal dust or slack—the waste of soft coal mines.

"Turf briquettes ordinarily contain about 66 per cent. of inflammable elements, the remainder being made up of inorganic ash and water. They are thus inferior as fuel to briquettes made from brown coal, which average 70 per cent. or more of inflammable matter. Both represent in their present form the utmost that science has been able to do in utilizing inferior and otherwise almost worthless materials to supplement and eke out the insufficient coal supply of European countries."

Workers in tin plate mills at Gas City, Ind., have organized and incorporated a co-operative company, the Pacific Tin Plate Company, to build and operate mills 10 miles from Los Angeles, Cal., whose citizens and others have donated 30 acres of land and have agreed to take $75,000 of stock in the company. The project is said to be the outcome of the unsatisfactory conditions recently existing in the Indiana tin plate industry. The capital stock is $300,000 and the incorporation papers were taken out in South Dakota. The officers are: Joseph Beaver, Gas City, president; George Bluett and Benjamin Clark, Gas City, vice-presidents; Frank J. Coppock, Jonesboro, Ind., secretary; James Elton, Gas City, treasurer. Members of the Amalgamated Association of Tin Plate Workers in many parts of the country are taking shares at $10 par value. The plan will be similar to that of the co-operative company at Greencastle, Ind., the stock of which is held by Anderson, Elwood and Gas City tin plate men.

H. K. McHarg of New York has been elected president of the Virginia Iron, Coal & Coke Company and of the Virginia & Southwestern Railroad Company.

The Duty on Steel Billets.

The question has been raised of the proper rate of duty on steel billets imported from countries in which manufacturers have two sets of prices, one for their domestic customers and a lower price for export. The duty on billets is regulated by their value, as shown by the following extract from the tariff act of 1897, paragraph 135: "— valued at 1 cent per pound or less, 3-10 of 1 cent per pound; valued above 1 cent and not above 1 4-10 cents per pound, 4-10 of 1 cent per pound," &c. The Collector of Customs at Philadelphia has decided that the duty should be levied on the basis of the price prevailing in the domestic markets of the country of exportation and not on the price actually paid for the billets at the foreign works, evidently being governed by his interpretation of Section 7 of the act of 1890 as amended in 1897, which now reads as follows:

Section 7. That the owner, consignee, or agent of any imported merchandise which has been actually purchased may, at the time when he shall make and verify his written entry of such merchandise, but not afterward, make such addition in the entry to the cost or value given in the invoice or *pro forma* invoice or statement in form of an invoice, which he shall produce with his entry, as in his opinion may raise the same to the actual market value or wholesale price of such merchandise at the time of exportation to the United States, in the principal markets of the country from which the same has been imported; but no such addition shall be made upon entry to the invoice value of any imported merchandise obtained otherwise than by actual purchase; and the collector within whose district any merchandise may be imported or entered, whether the same has been actually purchased or procured otherwise than by purchase, shall cause the actual market value or wholesale price of such merchandise to be appraised; and if the appraised value of any article of imported merchandise subject to an ad valorem duty or to a duty based upon or regulated in any manner by the value thereof shall exceed the value declared in the entry, there shall be levied, collected and paid, in addition to the duties imposed by law on such merchandise, an additional duty of 1 per centum of the total appraised value thereof for each 1 per centum that such appraised value exceeds the value declared in the entry, but the additional duties shall only apply to the particular article or articles in each invoice that are so undervalued, and shall be limited to 50 per centum of the appraised value of article or articles. Such additional duties shall not be construed to be penal, and shall not be remitted, nor payment thereof in any way avoided, except in cases arising from a manifest clerical error, nor shall they be refunded in case of exportation of the merchandise, or on any other account, nor shall they be subject to the benefit of drawback: *Provided*, That if the appraised value of any merchandise shall exceed the value declared in the entry by more than 50 per centum, except when arising from a manifest clerical error, such entry shall be held to be presumptively fraudulent, and the Collector of Customs shall seize such merchandise and proceed as in case of forfeiture for violation of the customs laws, and in any legal proceeding that may result from such seizure, the undervaluation as shown by the appraisal shall be presumptive evidence of fraud, and the burden of proof shall be on the claimant to rebut the same, and forfeiture shall be adjudged unless he shall rebut such presumption of fraudulent intent by sufficient evidence. The forfeiture provided for in this section shall apply to the whole of the merchandise or the value thereof in the case or package containing the particular article or articles in each invoice which are undervalued: *Provided, further*, That all additional duties, penalties or forfeitures applicable to merchandise entered by a duly certified invoice, shall be alike appliable to merchandise entered by a *pro forma* invoice or statement in the form of an invoice, and no forfeiture or disability of any kind incurred under the provisions of this section shall be remitted or mitigated by the Secretary of the Treasury. The duty shall not, however, be assessed in any case upon an amount less than the invoice or entered value.

The decision of the Philadelphia Collector bears upon several lots of billets which have been brought in at that port. As previously stated in these columns, the increased duty claimed is $2.24 per ton, which would decidedly check American purchases of foreign billets, unless the makers still further reduce their prices so as to bear all or a large part of the higher duty thus imposed. The importers have appealed from the decision of the Philadelphia Collector and the matter has been referred to the Board of General Appraisers at New York, who began to receive evidence on Tuesday of this week. As the subject is an important one and a great deal of testimony will be submitted, it will be some time until a decision is rendered.

Importers of experience have guarded against loss under such circumstances as these by the insertion of the following proviso, or one similar to it, in all their contracts: "This price is subject to reduction or increase to the extent of any change hereinafter made in the rate of duty to be paid on these goods arising either by change of existing laws or by change in rulings of Treasury Department under existing laws."

Probably the most serious feature of the matter from the standpoint of the importers and of the rolling mills who have purchased foreign billets is the penalty for alleged undervaluations, which in some cases would reach a very large sum as compared with the advance in the rate of duty. In itself in certain territory the higher rate of duty on billets would not cut off importations.

Importers, we understand, are making the point that the domestic prices for steel billets in Germany do not really deal with what we could call wholesale transactions, that in Germany steel Billets are not sold to German rolling mills or forges in large blocks, because the rolling mills make their own steel. It is claimed, therefore, that the prices made for steel billets in Germany to German consumers are really of a retail character.

We understand that the duty on steel blooms is not at all affected by the recent rulings.

The Crops.

The average condition of the corn crop on October 1, according to the monthly statement of the statistician of the Department of Agriculture, was 79.6, as compared with 84.3 on September 1, 1902, and 52.1 on October 1, 1901. In the averages of condition in the principal corn growing States is revealed the depreciation which was foreshadowed in commercial reports, especially in Iowa, Wisconsin, South Dakota and Minnesota, the loss ranging from 15 to 27 points, the heaviest decline being in Minnesota, where the drop during the month was 27 points. There was also considerable deterioration in Kansas and Nebraska and a slight decrease in Indiana, Ohio, Pennsylvania and Michigan. However, the indicated yield, based upon 30 bushels as par and an area of 94,869,000 acres is in round figures about 2,225,000,000 bushels, which has been exceeded but once in the history of the country.

The preliminary estimate of the average yield per acre of spring wheat according to Government figures is 14.4 bushels, which is subject to revision when the final estimate is made. In the States which have sown 100,000 acres and upward of spring wheat the average yield per acre is from 10 bushels in Kansas to 28.1 bushels in Idaho. In Nebraska the average yield was 13.9 bushels. The Government figures indicate a yield of spring wheat of about 246,000,000 bushels, making a total wheat crop of 626,000,000 bushels, the indicated winter wheat crop being 380,000,000 bushels, as previously reported.

Fine weather for preparing the soil to receive the fall seed is reported to have prevailed throughout the winter wheat belt, and with the soil in excellent condition rapid progress has been made in seeding operations, indications pointing to a full average area sown.

Great surprise was occasioned in Chicago by the estimated yield of oats, 34.5 bushels per acre being 2.5 bushels more than the generally accepted par yield figure. The suggested yield of the crop is 980,000,000 bushels, which is upward of 200,000,000 bushels above the popular estimate based on the September report. The present estimated yield per acre is the largest ever reported by the Department of Agriculture. Another point of much prominence is the high average yield in some of the States, as 41.1 in Ohio, 40 in New York, 39.9 in Wisconsin, 39 in Minnesota and 37.7 in Illinois. In the Chicago pit there was some disposition to insist

that if so large a crop had been raised oats should be coming in more freely. Less has been heard in Chicago recently of the damaged condition of oats, but private reports indicate that in many sections oats are musty.

The preliminary estimate of the yield of barley per acre is 29 bushels, as against 24.7 on October 1, 1901. 20.4 at the corresponding date in 1900 and 23.3 the mean of October averages for the last ten years. The average quality is 87.3, against 82.9 last year and 82.1 in 1900.

The preliminary estimate of the yield of rye per acre is 17 bushels, against 15.1 bushels on October 1, 1901, and 14.4 bushels the mean of the last ten years. The average for quality is 81.9, as against 89.4 last year and 82 in 1900.

The average condition of buckwheat on October 1 was 80.5, as compared with 86.4 last month and 80.2 the mean of the averages for the last ten years.

The tobacco crop has given indications of improvement in the most important producing States, except Ohio, in which State the condition remains the same as a month ago.

The average condition of the potato crop on October 1 was 82.5, as against 89.1 last month, 54 on October 1, 1901, and 71.6 the mean of the averages for the last ten years.

All of the important sugar cane growing States, with the exception of Texas, report conditions below their respective ten-year averages. It is notable that the principal apple growing States report conditions ranging from 2 to 21 points below the mean of their October averages for the last seven years, and the condition of rice, as reported by the principal States in which this crop is raised, is from 1 to 23 points below the respective averages for the last eight years, Georgia being the only State which has maintained that average.

The Exhibition of the Massachusetts Charitable Mechanics' Association.

The twenty-first triennial exhibition of the Massasetts Charitable Mechanics' Association opened at the building of the association on Huntington avenue, Boston, September 22, and will close November 1. The purpose of the exhibition is to show the progress of mechanical, electrical and engineering arts. There are a large number of exhibitors and a variety of products. The machinery and tool exhibit occupies a large proportion of the basement space, and the exhibit of light hardware and other metal products is scattered throughout the first floor. There is not so much space given to machinery, tools and metal manufacturing equipment in general as in former years, but the exhibition as a whole is well selected and satisfactory.

The American Roller Bearing Company of South Boston, Mass., illustrate the merits of their bearings by having a number of large wheels fitted with them and run by a small toy motor. One of the wheels shown weighs over 650 pounds.

The American Track Barrow Company, Lowell, Mass., show a barrow used principally in railroad construction and repair work.

E. B. Badger & Sons Company, 63 Pitts street, Boston, Mass., offer a striking exhibit of their line of fire extinguishers, ventilators, boilers and metallic frames and sashes.

H. K. Barnes, 104 Franklin street, Boston, exhibits his Phœnix and Fire King fire extinguishers and his line of mineral tanned leather belting and aprons.

Barney & Berry, Springfield, Mass., have an attractive case filled with their line of skates.

F. W. Bird & Son, East Walpole, Mass., show their product in a booth constructed with pillars of the Parold and Neponset roofing paper.

Boston Gear Works, 152 Purchase street, Boston, have small model machines to illustrate the work and the various motions of their gears.

George W. Bowers, Waltham, Mass., shows the Bowers file and tool holder and a sheet metal cabinet, with lock, for the holder. The holder occupies a space on the wall of only 6 x 15 x 6 inches when closed, and holds 47 files or tools.

Brown & Wales, 69 Purchase street, Boston, have samples of all sizes of the steel balls and tubing made by the Shelby Steel Tube Company.

The Carborundum Company, Niagara Falls, N. Y., illustrate the different steps in the preparation of their products which make an interesting exhibit.

Chandler & Barber, 124 Summer street, Boston, show some of the products of the Russell & Erwin Mfg. Company, New Britain, Conn.

Chandler & Farquhar, Federal street, Boston, have a large space in the basement, where they show some 38 products. These are as follows: American Tool Works Company's engine lathe, motor and belt driven; back gear shaper motor driven radial drill. Bradford engine lathe, made by Bradford Machine Tool Company, Cincinnati, Ohio. Iroquois Machine Company's universal grinder, Auburn tool grinder, Franklin Machine Company's crank pin turning machine, Walker universal cutter and reamer grinder, Perkins' power press, Worcester motor and belt driven drill grinder, Hubbell riveting and tapping machine, made by Harvey Hubbell, Bridgeport, Conn.; Francis Reed Company, Worcester, Mass., sensitive drill; W. F. & J. Barnes Company, Rockford, Ill., upright drill; Greenerd arbor press, Springfield oil separator, Knecht Bros. sensitive drill, Bayldon disk grinder, Bayldon interchanging tool post, Ideal engine lathe, Federal planer and speed lathe, Estep & Dolan's angle bender, Gay bench speed lathe, J. A. White band saw, buzz planer, boring machine and saw benches; La May cold saw and cutting off machine and Armstrong Bros. Tool Company, Chicago, Ill., tool holder. The exhibit also includes a complete line of the Brown & Sharpe Mfg. Company's machine tools and mill cutters; the products of the Morse Twist Drill & Machine Company, and the Norton Emery Wheel Company.

The Chase-Shawmut Company, Boston, show for the first time in New England a De Laval steam turbine in practical operation, which is of interest to all users of steam power. The Chase-Shawmut Company are agents for this turbine.

The Coates Clipper Mfg. Company, Worcester, Mass., have a good exhibit of their hand and power clippers for sheep raisers, barbers and horsemen.

The Earnshaw Mfg. Company, 110 Pemberton Building, Boston, show the Earnshaw steam generator, the Warnock pipe wrench and Gilbert's gauge glass preserver. The steam generator is a device to attach to a horizontal tubular boiler to create a circulation and also to increase the heating surface.

The F. W. Foster Mfg. Company, 6 Portland street, Boston, make a special exhibit of their shaking grate for steam boilers, and show one which measures 7 x 20 feet, the largest in the world, or, as they put it, "the greatest grate in this great world." The company also show float valves and their Neverleak ball cock.

The Gallagher Mfg. Company, Lynn, Mass., have a complete exhibit of their specialties in cornice snears, universal ratchet drills, pattern shears, buffing lathes, speed indicators, emery grinders and track drills. The track drill is their latest product.

Hale & Benjamin, Greenfield, Mass., show an automatic blind hinge with awning hinge attachment and other patented automatic blind hinges.

J. B. Hunter, 60 Summer street, Boston, gives an excellent retail hardware exhibit on the main floor and the hangers of the Coburn Trolley Track Mfg. Company in the basement.

Lamb & Ritchie, Cambridgeport, Mass., show their tin lined iron pipe. It consists of a substantial tin pipe welded into a wrought iron pipe.

Loop Lock Machine Company, Waltham, Mass., successors to the American Watch Tool Company, show the Bath universal grinder in the booth of the Carborundum Company.

The Smith Single Belt Reversing Countershaft Company, Melrose, Mass., exhibit an interesting style of countershaft for milling machines, engine lathes and other tools. The company claim several important advantages for this countershaft.

The Boston office of the Southern Railway Company takes up a large amount of space on the main floor to show the industrial advantages of the South.

The Spaulding Print Paper Company, 44 Federal street, Boston, show the Federal blue printing machines for making blue prints from architectural and machine drawings.

J. O. Walton, Boston, exhibits the Walton self locking tackle block.

O. S. Walker & Co., Worcester, Mass., show a magnetic chuck, motor driven surface grinder and Globe tool sharpener.

Waterbury Tool Company, Waterbury, Conn., exhibit the Williams universal ratchet drill.

The Scotch Steel and Iron Trades.

Two Scotch Steel Works to Combine.

GLASGOW, October 2, 1902.—A combine is projected between John Brown & Co., Limited, and Thomas Firth & Sons, Limited, which has a special interest and significance for Glasgow. The steel works of both are at Sheffield, but the shipbuilding yard of John Brown & Co. is at Clydebank, Glasgow, where they now carry on the business founded by the late firm of J. & G. Thomson. At Clydebank is about to be built one of the largest battle ships in the world. Last week the Admiralty placed with John Brown & Co. the order for the only battle ship to be built on contract under the 1902 programme—a sister ship of one to be built at the Government dockyard at Portsmouth. But this Clydebank battle ship will resemble the ships that are already being built on contract by the Fairfield Company on the Clyde and the Vickers Company at Barrow. That is to say, it will be 425 feet in length, 78 feet in beam, 26¾ feet in draft and will displace 16,320 tons, which is about 1100 tons more than any British or foreign battle ship at present afloat. It will have engines of 18,000 indicated horse-power supplied with steam at 210 pounds working pressure by an installation as to four-fifths of the power of Babcock & Wilcox water tube boilers and as to one-fifth of closed stokehold cylindrical boilers. It will be armored by broadside plates 22 feet in breadth and of 7 and 9 inches in thickness. The armor is usually a separate contract from the hull and machinery of a war ship, but John Brown & Co. are also armor plate makers at Sheffield.

What, then, is the object of the combination with Thomas Firth & Sons, who turn out much the same class of steel products? The arrangement is supposed to be much like the "community of interests" established in the Vickers-Beardmore combine, and to put the Clydebank organization on a similar plane for naval work. Now while John Brown & Co. at Sheffield roll armor plates, as the Beardmore Company do at Glasgow, Thomas Firth & Sons manufacture gun castings, ordnance and projectiles, as the Vickers Company do. Thus the Brown-Firth combine will be able to turn out a complete war ship—hull, armor, machinery and armament. The Firth factory turned out the steel for the famous "Woolwich infants," and this will now be developed into a great ordnance factory. To be on an equal footing with the Vickers-Beardmore alliance, however, the manufacture of gun carriages and mountings will have to be added, and this means the erection of heavy and costly new plant. Such a combination as that now being negotiated has long been expected in the trade, but the financial aspects of it are not yet known.

In this connection it may be noted that the first-class cruiser "Berwick," launched recently from the yard of William Beardmore & Co., was put into the water with all her armor and casemates complete, and is the first war vessel built in Scotland by one firm supplying the whole material as well as the structure. The Beardmore Company have still another cruiser of the same size (9800 tons) and type in course of construction.

Output of Scotch Shipyards.

The battle ship contract above referred to as secured by John Brown & Co., Limited, largely swelled the total of new business booked by Clyde shipbuilders in September. Otherwise the record would have been a sorry one. Not so much as 20,000 tons of new work was booked during the month by Scotch shipbuilders, in addition to this battle ship, which itself will represent 16,320 tons displacement. The other new contracts include four small steamers, to be built by the Fairfield Shipbuilding & Engineering Company for a Turkish company; a steamer of 4600 tons, to be built by Wm. Denny & Bros. for the Glasgow & Burmah Line; a turbine passenger steamer, to be built by the same firm for the London, Brighton & South Coast Railway Company's cross channel service; a 3000-ton steamer, to be built by the Greenock Dock Yard Company for French owners; a 1500-ton boat, to be built by the same firm for the Leith and Antwerp trade; a cable laying steamer, to be built by Napier & Miller for the West India & Panama Telegraph Company, and a cargo boat of 3000 tons, to be built at Dundee. With the exception of the last named, all these newly ordered craft are for special services, and the building of them is not so much a matter of market as of the immediate needs in their own particular lines of employment. There is, in fact, no revival in the demand for merchant tonnage.

The output of the Scotch shipyards in September was 33 vessels, aggregating 57,900 tons, and this brings up the total for the three-quarters of the year now expired to 396,600 tons. The total for the corresponding portion of last year was 395,420 tons, and that was a record figure. The Clyde proportion in September was 53,050 tons, and in the nine months 362,290 tons. Of the new tonnage launched in September, 10,820 tons was for London owners, 20,400 tons (two cruisers) for the British Government, 1600 tons for Spain, 1300 tons for Holland, 670 tons for other foreign owners, 520 for the British colonies and all the rest for British ownership. There were two steel sailing vessels, of 2400 tons and 2100 tons, built respectively by the Dundee Shipbuilding Company and by A. McMillan & Son, Dumbarton, but with these exceptions the output was in steam tonnage. The Scotch shipbuilders have still a good deal of work on hand, though not booking much new.

The American Demand Growing.

The demand for pig iron from America seems to become larger as the year advances. Exactly how much has been sold for shipment to the United States it is impossible to state, because the orders have been so widely distributed; but since I last reported it is known here that 10,000 tons of Cumberland hematite have been sold and that 20,000 tons of Cleveland ordinary and hematite are awaiting tonnage at Middlesbrough. Most of these orders have come through Glasgow in addition to the Scotch iron, of which a large quantity has this week again been ordered from Scotch firms. From all I can gather I estimate that there are fully 60,000 tons to be shipped from the various ports within the next few weeks. What is being shipped from the Tees is going to Philadelphia and Baltimore at 6 shillings per ton freight, sometimes even a trifle less. One steamer has been loading Cleveland iron at Leith for the United States, bringing the cargo round by coast boat from Middlesbrough at ship's expense. This is an odd proceeding, which may cause some people on your side to suppose that you are importing Scotch iron from Firth of Forth instead of from the Clyde, but this is not so. All the Scotch iron going to America is shipped from Glasgow, and it is mostly going by the liners. German iron is going across at such freights as 7 shillings per ton from Rotterdam to New York. On such a freight basis Germany can undersell both Cleveland and Scotland just now, and in point of fact is doing so. There is so little Cleveland iron available that to make up the cargoes of steamers chartered for America the stores have to be drawn upon. Last week some 7000 tons were taken out of the Middlesbrough warrant yard for shipment, on one day close upon 5000 tons, which certainly was a big delivery. From the Glasgow stores 3600 tons were withdrawn, leaving there now only 37,000 tons. The total shipments from Scotland this year to Saturday last were 264,672 tons, as compared with 202,696 tons last year, an increase of 61,976 tons. The total imports to the same date of Cleveland iron were 363,533 tons, an increase of 47,202 tons. There is very little speculative business doing in war-

rants and it is not the policy of those who hold the cards to allow the market to run away. To discourage bull buying occasional small lots are let loose by holders, who, nevertheless, take up all that bears are willing to sell. During a flop in the warrant market this week in sympathy with the fall in the stock markets iron was being quietly bought at all times.

While the output in Scotland is rather more than last year, the output in Cleveland is much about the same as a year ago. If there were more ore available more furnaces might be lighted, but the American demand is not in itself enough to encourage this, with a decreasing home consumption as shipbuilding declines, a diminishing European demand and an increasing export from Germany. Within the last few days three cargoes of 5000 tons each of German iron were placed for shipment to the United States, and with the pressure of Germany to sell the run upon Cleveland may be expected to ease off. At all events there are not quite so many inquiries as a fortnight ago, although by the accounts received from your side it would seem that you will still need a good deal from us besides what has been already actually contracted for. The American demand has undoubtedly improved the hematite trade, which has rather languished before the poor home prospects in the steel industries. Cleveland No. 3 has been selling at 53 shillings to 53 shillings 6 pence and has not fluctuated with warrants, and No. 4 foundry iron is 52 shillings 6 pence. Cumberland hematite is 62 shillings, Middlesbrough hematite 58 shillings and Scotch hematite 62 shillings. The bimonthly credit of the North of England manufactured iron trade shows that the average selling price in July and August of bars, plates, angles and rails was £6 3s. 11d. per ton, which is an improvement on the previous audit, though it makes a reduction in the average of 4 shillings 9 pence per ton since the beginning of the year. Compared with the highest, of 1900, the present average is £2 2s. per ton down; compared with the lowest, of 1895, it is about £1 10s. up.

This week has witnessed the phenomenon of the charter of a steamer to take 5000 tons of hard coal from the Clyde to New York, Philadelphia and Boston. The freight is said to be 8 shillings per ton and the quality is a sort of anthracite, though perhaps it is not a true anthracite like the Pennsylvania coal. There is not a great deal of this class of coal in Scotland, and even in Wales the supply of anthracite is limited. In the market here orders are reported to have been received for cargoes of ordinary Fife coal, to be shipped at Grangemouth, and also of steam, to be shipped at Cardiff, and of ordinary "Wallsand" house coal, to be shipped at Newcastle, to your side. These are, indeed, strange developments.

The agreement between the Government and the Cunard Company is of special interest in Glasgow, which was the birthplace and is the practical headquarters of the Cunard Company. It is considered that the company have made a very good bargain and that the increased subvention (which is not a subsidy or bounty) is warranted by the services which the company are called upon to perform for the State. The building of two swift new leviathans for the purpose will be a welcome addition to our shipbuilding programme.

B. T.

Among the most recent installations of Duluth stokers, manufactured by the Duluth Stoker Company, Duluth, Minn., are the following: Steamers "Gen. O. M. Poe," "Mataafa" and "James H. Hoyt," United States Steel Corporation Building, Duluth, Minn.; the Eastern Shipbuilding Company, to go into vessel No. 1, which they are building for the Great Northern Railway Company, to ply upon the Pacific Ocean between the United States and Asia; Duncan Company, paper manufacturers, Mechanicsville, N. Y.; the Lake Superior Power Company, Sault Ste. Marie, Ontario; the Pittsburgh Steamship Company for their steamers "F. B. Morse," "Empire City" and "Harvard"; the Provident Steamship Company for two new ships, and the Great Lakes & St. Lawrence Transportation Company for four new ships.

The Projected Cuban Reciprocity Treaty.

WASHINGTON, D. C., October 14, 1902.—Considerable progress has been made in the negotiation of the projected reciprocity treaty between the United States and Cuba and the matter has now reached what might be termed a critical stage, when further progress will depend largely upon the attitude of the Cuban Government toward the propositions advanced by the United States. The situation is somewhat complex, but it is the belief of high administration officials here that a fairly satisfactory convention will be concluded before Congress meets and that it will be ratified without great difficulty.

The basis for the concessions which it is proposed that Cuba shall make to the United States has been tentatively arranged through the co-operation with the State Department of the experts of the Insular Division of the War Department, who had charge of customs matters in the island under the military administration. An ingenious method has been adopted to provide concessions to the United States. An average differential in favor of American products approximating 25 per cent. is taken as the measure of the concession and a maximum and minimum tariff is provided, the present rates being taken as the minimum. Advances ranging from 10 to 60 per cent. over the present rates, but averaging 25 per cent., are provided for all goods entering the island from other countries than the United States, the margin in favor of American products being adjusted with a view to giving the entire trade of the island to American exporters. The purpose in advancing the present rates on foreign merchandise, rather than reducing them on goods coming from the United States, is to prevent a reduction in the revenue, which the island Government believes cannot be spared at the present time.

The reciprocal concession which it is proposed the United States shall make, in consideration of the differential rates referred to, is a horizontal reduction of 20 or 25 per cent. in the Dingley rates on Cuban products. This concession is chiefly important as applied to sugar and tobacco, but iron ore, tropical fruits, oranges and other products will also be benefited. The administration would be glad to increase the proposed cut in the rates on Cuban products, but the impossibility of ratifying a treaty, which requires a two-thirds vote of the Senate, in the face of the opposition of those Senators who object to a reduction exceeding 20 per cent. on Cuban sugar is recognized, and it is believed to be the part of wisdom to submit to the Senate a treaty that can be ratified rather than to send in a convention that will either be rejected or materially amended.

The plan of concessions on American products above outlined has been informally submitted to the Cuban Government through diplomatic channels, and negotiations are practically at a standstill until the views of the Government have been learned. It is known that President Palma and his colleagues are far from satisfied with the small concession which it is proposed to make on Cuban products and a serious hitch may result. The Cuban authorities also seem to be of the opinion that the concessions asked by the United States, although averaging no more than it is proposed to grant to Cuba, have been so manipulated in the arrangement of the schedules as to constitute very great advantages, practically shutting out foreign competition. The officials here are hopeful, however, that the Cuban Government will recognize the desirability of concluding a treaty that can be ratified and will speedily accept the terms offered.

With regard to the attitude of the so-called beet sugar Senators on the subject of a reciprocity treaty with Cuba there has been an important change of view within a very few days. Representatives of the beet sugar interests in the Western States have conferred with their Senators and have indicated their willingness to accede to a cut of 20 per cent. in the duty on Cuban sugar. This does not mean that the Senators who fought the reciprocity bill of the last session will accept the treaty without question, but it is believed they will consent to its ratification provided the cut in

the sugar duty is limited to 20 per cent. The domestic tobacco interests are not very favorably disposed toward the proposed reduction, especially on manufactures of tobacco, but it is believed certain concessions will be made to this interest that will reconcile it to the terms of the treaty. W. L. C.

Steel Works in Japan.

Engineers and steel manufacturers in Europe and America have been watching with interest the reports which have come to hand from time to time of the steel works being constructed by the Japanese Government at Wakamatsu, about 9 miles to the west of Moji, the large and well-known coaling port on the Shimonoseki Straits and the northern terminus of the Kiushiu Railway, and we have noted the progress which has been made. The original estimate of the cost of the works was something over 4,000,000 yen (about $2,000,000), and the consent of the Diet was obtained for that expenditure. In consequence, however, of a report which was received from Mr. Oshima, an engineer who had been sent to Europe and America to make investigations, it was seen that this amount was altogether inadequate, and that at least 10,000,000 yen more would be required. This and subsequent additions were voted by the Diet, until a total appropriation of over 20,000,000 yen was reached. That should have sufficed, and would have sufficed had prices remained as they were in 1896 and 1898, when the estimates were prepared; but prices rose rapidly, and Mr. Wada, the director, found himself obliged to ask for a supplementary grant. This the Cabinet did not agree to include in the estimates, and thus Mr. Wada found himself in a very difficult position; for if he had paid for all the machinery ordered abroad he would be entirely without funds to complete the works in Japan, and the foundry would have been left unfinished—a conspicuous monument of failure. Luckily at that time there was a sum of money left unused, owing to the fact that the work for which it had been originally appropriated was either not yet begun or not completed. This sum was sufficient to pay the price of the goods bought on contract, and, with the consent of the Minister of Agriculture and Commerce at that time, it was used for this purpose. In his anxiety to carry out his work to a successful issue Mr. Wada chose what he thought was the lesser of two evils, but in doing this he broke official regulations. The consequence was an inquiry by the High Committee of Civil Service Investigation, and Mr. Wada has been dismissed from the service with a reprimand, which precludes him from holding any official appointment for two years. No charge has been made against either Mr. Wada's honor or honesty, and much sympathy has been expressed for him, as it is felt that he has suffered on account of his enthusiasm for his work.

It is not at all probable that the establishment at Wakamatsu will be allowed to become a failure, but it certainly will have cost an immense sum before it is got into complete working order. While it is impossible not to admire the pluck and enterprise of the Japanese in matters requiring long experience, they should go slowly, so that their progress may be sure. Iron and steel works are the results of generations of experience, and a beginning should have been made in Japan on a small scale. Writing on this subject, the Japan *Daily Mail* says:

> It is impossible not to recall at this juncture the fact that when the establishment of an iron foundry was contemplated by the Government offers are understood to have been made by foreign firms of the highest standing, who were prepared to build and start the foundry under conditions by no means onerous to Japan, and who would have agreed to hand over the whole concern to the State after a certain term of years. The Government doubtless gave the matter full consideration and came to the conclusion that it could do better on its own account. Perhaps events will ultimately justify that decision, but it must be confessed that the outlook is not promising at present. An immense sum has already been expended; further appropriations are necessary; the foundry is not yet able to do the work for which it was intended; and the Diet has actually approved a project for constructing another foundry at Kure. It appears to us that this is a case of going too fast. Japan has no occasion to give any further proofs of independent competence. What she has to think of now is how to get her wants supplied in the cheapest and most efficient manner, let the requisite assistance be procured whence it may.

This seems good advice, and probably the Japanese Government will profit in the future from the experience at Wakamatsu.—*Engineering.*

MANUFACTURING.

Iron and Steel.

Morss & Whyte, wire manufacturers, Cambridge, Mass., have under construction a large three-story addition to their plant.

The strike at the works of the Union Drawn Steel Company, at Beaver Falls, Pa., makers of steel shafting and shapes, has been settled on terms satisfactory to both sides.

The Beaver Works of the American Tin Plate Company, at Lisbon, Ohio, which have been closed down for several months, will probably remain idle for an indefinite period. The local salaried officials have been notified that their services will be no longer required and they are at liberty to look for other positions.

The Zenith Furnace Company, Duluth, Minn., are considering the advisability of putting in about 80 coke ovens at their plant, but have no further improvements under contemplation at present.

The universal mill of the Central Iron & Steel Company, at Harrisburg, Pa., rolled some record heats last week. A number of slabs, the largest weighing 7,000 pounds, were rolled into steel plates 72 feet long, 32 inches wide and 3-16 inch thick. These plates will be used in the construction of the middle span of the new East River Bridge. While this by no means represents the extreme length or width of plates rolled in this mill, it established a new record for weight of slabs used. All the steel plates used in the construction of the East River Bridge have been or are being rolled by the Central Iron & Steel Company for the Pennsylvania Steel Works.

The Knoxville Iron Company, Knoxville, Tenn., are dismantling the Harriman mill and will consolidate it with their Knoxville works in a new location in the latter city. They expect to be running in their new works within 60 days.

The F. A. Goodrich Iron & Steel Company, Detroit, Mich., have incorporated with a capital stock of $50,000, half paid in. The shareholders are F. A. Goodrich, J. C. W. Lauchean, Wm. Gerhauser and Fred. H. Holt.

The Driver-Harris Wire Company, Harrison, N. J., advise us that they have just completed a one-story brick addition, 25 x 120 feet, to their plant and are putting in a full line of heavy machinery, a large tempering furnace, maker and annealer. In about two weeks they will be in a position to furnish steel wire in all sizes, making a specialty of the high grades, as well as wire of other metals.

The four furnaces of the National Steel Company, in the New Castle, Pa., district, turned out in September about 45,000 tons of iron. This entire output was consumed in their Bessemer Works at New Castle.

The scarcity of coal may result in the complete shut down of the Delaware River Iron & Ship Building Company of Chester, Pa., this week. Trouble is now being experienced in the plate rolling department, where bituminous coal is used to generate gas for the furnaces, and the supply is insufficient to meet the demand. The inability to secure the requisite number of plates threatens to entirely halt present operations.

The Cleveland Steel Casting Company, Cleveland Ohio, have increased their capital stock from $100,000 to $200,000 for the purpose of enlarging their plant and extending the business. The additions to be made will increase the capacity of the works fully 150 per cent., and include the construction of a new open hearth furnace which will have a capacity of 105 tons per day. This is said to be the second works of the kind in Cleveland the first being the Otis Steel Works.

It is announced that the Railway Steel Spring Company, organized some months since, with a capital of $27,000,000, have taken over the Railway Spring & Mfg. Company of Washington, Pa., who were organized recently with a capital of $200,000, and whose trade was increasing rapidly in the manufacture of railway springs.

At the Rankin Works of the American Steel & Wire Company, Rankin, Pa., the night turn recently made 571,000 pounds of No. 5 rods, and the day turn following made 556,000 pounds. These figures break all previous rod rolling records.

The New Castle Bessemer Steel Works of the National Steel Company, at New Castle, Pa., John Reis, general manager, which were closed down last week for repairs, are again in operation. This plant has been materially improved and enlarged in the past year, and now has a capacity for turning out about 2000 tons of Bessemer steel per day.

General Machinery.

The American Construction Company, Boston, formerly at 153 Milk street, makers of Kempster's patent roller bearing sheaves and bushings, have removed to 255 Atlantic avenue. Machinery is being installed, and later their output will be enlarged.

Charles H. Besley & Co., 10-12 North Canal street, Chicago, Ill., report general business as good, the month of September having been one of the largest in amount of sales that they ever enjoyed. They are closing many contracts with manufacturers of agricultural machinery for their Helmet oil, Badger and Bonanza cups, they having been adopted by the McCormick, Piano and Deering divisions of the International Harvester Company, Avery Mfg. Company, Port Huron Engine & Thresher Company, Sandwich Mfg. Company, Safety Shredder Company, Newark Machine Company, Parsons Band Cutter & Self Feeder Company and others. They are making numerous shipments of their Gardiner grinders to various parts of the country and are receiving orders daily for complete shop equipments and tools and supplies for repairs and replenishing.

The Vulcanus Forging Company, Cleveland, Ohio, are having plans prepared for the completion of their plant and expect to have the new buildings in operation before December. Recently they have installed new machinery, increasing the capacity over 15 tons per day. F. H. Kindl, formerly chief engineer of the Carnegie Steel Company, has accepted the presidency and management of the company.

The Chattanooga Machinery Company, Chattanooga, Tenn., have commenced work on their new plant, the buildings of which are to cost over $25,000, exclusive of machinery. The first structure to be erected will be the foundry, which they hope to have completed by December. It will be of stone and brick, 60 x 120 feet, and will be equipped with a traveling crane and all modern appliances. The other buildings, including a machine shop, 100 x 150 feet; pattern shop, 50 x 60 feet, and office, will be completed in about a year.

The Anderson Foundry & Machine Company will enlarge both their plants at Anderson and Elwood, Ind. The plans for the main plant, which were decided upon some time ago, provide for a new building, 35 x 200 feet, one story; brick boiler shop, 30 x 80 feet, and probably an addition to the foundry. The Elwood plant is to be enlarged in the spring. The contemplated improvements will about double their present capacity.

The Victor Talking Machine Company, Camden, N. J., are having plans prepared for a four-story addition, 30 x 102 feet, to their plant. It will be of brick and steel and similar to the present building.

The Mallary & Taylor Iron Works, Macon, Ga., have recently enlarged their foundry. They have had an abundance of work during the whole year. Within a short time they built a self-contained engine with boiler and a kaolin crusher for the Georgia Kaolin Company, Macon, and also a number of saw mills for parties at points in Georgia and Florida.

The Atwell Machinery Company, Hamilton Building, Pittsburgh, have bought the equipment in the wire mill, fence shop and nail factory in the plant of the American Steel & Wire Company at Beaver Falls, Pa., consisting of various sizes of engines, boilers, dynamos and general machinery, which they are now wrecking and shipping.

The Tabor Mfg. Company, Philadelphia, Pa., have just shipped a carload of molding machines of the vibrator frame type to a large New England hardware manufacturer, and booked an order for 17 additional molding machines for the New York Air Brake Company, making a total of 45 machines furnished to these parties: six of the order are of the vibrator frame type, the balance being split pattern machines ranging in size from 18 x 27 to 15 x 21 inches.

The Green Bay Combination Anvil & Tool Company, Green Bay, Wis., have been incorporated with a capital stock of $5000. The officers and incorporators of the new company are R. I. St. Peter, president and treasurer; Dr. F. N. Brett, secretary; Charles V. Luin, general manager.

The Electric Construction & Machine Company have been organized at Moline, Ill., with a capital stock of $25,000, Thos. A. Burtchaell and Herman Schmidt of that city being prominent among the incorporators.

The Sinclair Scott Company, Baltimore, Md., manufacturers of canning house machinery, have applied for a permit to build a new machine shop at a cost of $20,000, exclusive of power equipment. Most of the required machinery will be moved from one of their other plants, the remainder being special.

The American Blower Company of Detroit, Mich., are building heating apparatus for installation in the factory of Wickham, Chapman & Co., Springfield, Ohio, and are installing heating and drying apparatus for the Lumiere North American Company, Burlington, Vt., and a large drying apparatus for the Composite Board Company, at Niagara Falls, N. Y.

Thomas Bailey & Co., Athens, Ga., will enlarge their foundry and machine shop.

The Pennsylvania Railroad Company have awarded the contract to Ryan & Kelley of Philadelphia for erecting the boiler and machine shops at Shellport, Del. The new shops of the company at this point are to be known as the Shellport shops, and will consist of a number of buildings for various purposes, some of which are already under contract, and others will be contracted for as plans are completed from time to time.

Boilers, Engines, &c.

S. R. Callaway, president, and A. J. Pitkin, vice-president, of the American Locomotive Company, were in Pittsburgh last week inspecting the works in that city. It is the intention to very much enlarge the plant, which is badly cramped for room and which has orders enough on hand for locomotives to take practically its entire output for all of 1903. In fact, it is stated that the company have so many contracts for locomotives that some of them will not be completed before 1904.

Commissioner of Public Works Blocki of Chicago has let the contract for three new pumps for the Chicago avenue station to the Allis-Chalmers Company. They are to cost $266,000 and be capable of pumping 25,000,000 gallons of water an hour.

The Taylor Water Tube Boiler Company, Detroit, Mich., manufacturers of marine water tube boilers exclusively, have plans ready for a three-story brick building, 54 x 85 feet.

Charles L. Cooke, president Board of Trustees, Watonga, Okla., advises us that the recent election, at which it was voted to issue $16,000 in bonds for water works, proved to be illegal. Another election will be held in the near future, when it is probable the bond issue will be decided favorably.

For the proposed water works at Fayette, Iowa, a 20 horse-power gasoline engine, triplex pump, &c., will be required. As soon as details of specifications are completed bids will be asked. George A. Oliver, mayor.

J. S Chapman, President, Castile, N. Y., informs us that bids will be wanted about October 15 for constructing an electric plant to cost $10,500. W. J. White is engineer, 111 White Building, Buffalo.

R. W. Dick, mayor, Ardmore, Ind. Ter., advises us that the election for issuing $150,000 in bonds for water works has been carried and as soon as the bonds shall have been sold construction will be commenced.

J. S. Scholfield's Sons Company, Macon, Ga., occupied their new works about two months ago. They have seven acres of land, on which six buildings have been erected, which cover three-fourths of it, the remaining fourth being held to be utilized as business increases. The machine shop is 80 x 125 feet, the foundry being of the same dimensions. A runway of 100 feet connects them, giving a building 350 feet in length under one cover. The boiler shop is 80 x 275 feet; blacksmith shop, 40 x 65 feet; power house, 40 x 90 feet; pattern shop, 50 x 125 feet, and office and store house, 80 x 125 feet, of two stories. In addition there are sheds for storage of sheet iron, pipe and boiler tubes. Light and power is supplied by electricity, and overhead traveling and smaller cranes are in the machine and boiler shops and foundry. Such machinery as was in good repair in the old works was transferred and considerable new machinery and tools were installed. In the boiler shop is a new hydraulic riveting plant, also punches and rolls, in the machine shop new lathes, planers and boring mills, and in the foundry a new Whiting cupola, fan and hydraulic elevator. In the power house there is a new Corliss engine of 150 horse-power, with electric generators. The leading products of the company are engines and boilers, the territory covered being from Virginia to Texas.

The R. D. Cole Mfg. Company, Newnan, Ga., manufacturers of engines, boilers and tanks, have made a number of improvements in their plant during the year. They have just completed a new three-story brick warehouse and are erecting a shop, 80 x 200 feet, equipped with overhead traveling cranes and elevator. Their boiler shop has been enlarged and a Niles boiler head flanging machine, capacity 12 to 78 inches, added. A new Lodge & Shipley lathe has been recently added to their machine shop equipment. They have opened a branch office in Atlanta, Ga., in charge of E. M. Cole.

The Park Mfg. Company, Charlotte, N. C., have had excellent demand for their boiler feed pump and heater and their various kinds of elevators. Increase of business makes it imperative that their equipment be increased, and they expect shortly to install a new pulley lathe.

The Vulcan Iron Works, New Britain, Conn., are installing a new power plant, comprising a 150 horse-power Stewart boiler and a 150 horse-power Slater engine, with up to date equipments included.

The President and Board of Trustees of the village of East Dundee, Ill., will receive bils until October 21 for the construction of a standpipe, engine and pump, in accordance with the plans and specifications prepared by C. H. Patten, engineer, now on file in the office of the village clerk.

The consolidation of the Cochrane Refrigerating Machine Company of Lorain, Ohio, and the Brown Gas Engine Company of Columbus, has been effected under the name of the Brown-Cochrane Company, capital stock $110,000. Contracts have just been let for the erection of a large factory at Lorain. The new company will continue the lines of both the old concerns.

The District Commissioners of Washington, D. C., will receive proposals until October 18 for finishing and erecting pumping machinery, boilers and auxiliaries for a sewage plant.

Foundries.

The Barnard & Leas Mfg. Company, Moline, Ill., manufacturers of special mill and elevator machinery, have purchased a site on Twenty-third street, where they will erect a modern foundry in the near future.

The plant of the Atlanta Car Wheel & Mfg. Company, Atlanta, Ga., is now nearing completion and is expected to be in operation within 30 days. The product will be castings and car wheels.

The Phœnix Iron Works, Portland, Ore., have resumed operations after an idleness of nearly four months due to damage by fire. The company have issued a circular letter to the trade announcing that their new plant is equipped with the latest improved machinery, including a foundry complete with a full line of standard patterns.

The Globe Foundry Company, manufacturers of castings, on West Second street, Cincinnati, Ohio, are negotiating for the purchase of a large strip of land on Spring Grove avenue for a site for their new plant.

The plant of the Graham Foundry & Machine Company, at Monongahela, Pa., was completely destroyed by fire last week. They will rebuild on a larger scale, near Monongahela. The company advise us that all their catalogues and price-lists were destroyed in the fire and they would be pleased to have the trade send new ones to them.

The Rock Island Iron Works, Rock Island, Ill., in order to keep pace with their growing business will erect an entire new plant to take the place of the one now occupied. The new factory building will be 80 x 300 feet and two stories high.

The Rochester Iron Works, Lull & Marquardt, proprietors Rochester, Minn., are erecting a brick building in the rear of the structure now occupied, 30 x 46 feet and one story high. The building will be used for foundry purposes.

J. P. Symons & Co., Centralia, Wash., are erecting a large foundry and machine shop in that city at a cost of $35,000. The plant will have a floor space of over 12,000 square feet and will consist of a complete iron foundry, machine shop and supply warehouse, being fitted to do all kinds of repair work and build engines and boilers. Machinery, supplies, &c., are now being purchased in the East for its equipment, and it is expected that it will be put in operation by January 1 next.

The Wilks Foundry Company, Toledo, Ohio, who have been operating their foundry for but a few months on the heaviest castings, already find their facilities entirely inadequate and expect in the near future to erect an additional structure running back 100 feet to accommodate the demand made upon them. The company make a specialty of producing the largest single piece castings. They are busily engaged at present upon electric light and power station work of a superior quality, free from blow holes and exceptionally smooth of face. Charles T. Wilks is general manager and brings with him an experience as a practical molder covering upward of 25 years.

The Kelly Foundry & Machine Company, Goshen, Ind., will within the next two weeks begin the construction of additions to their plant which will give them over 14,000 square feet of additional floor space. These will include addition to steel tank department, 52 x 103 feet, two stories; addition to foundry for storage purposes, and a new brick warehouse 26 x 130 feet.

What is believed to be the largest anchor ever cast has just been finished at the plant of the Seaboard Steel Casting Company, at Chester, Pa. It is one of a pair for the Eastern Shipbuilding Company and weighs 16,800 pounds. It is of the "admiral" type, stockless, and will be used on one of the Great Northern Railway steamships for service between Seattle and the ports of China and Japan, now building at New London, Conn.

The Brown & Sharpe Mfg. Company, Providence, R. I., are erecting a new foundry which, it is said, will be the largest foundry in Rhode Island.

Bridges and Buildings.

The merging of the Wichita Bridge & Iron Company, Wichita, Kan., and the Oklahoma Bridge & Steel Structural Works Company, Enid, Okla, has resulted in the incorporation of the Southwestern Bridge & Iron Company, at Enid, with a capital stock of $100,000. The incorporators are George H. Bradford, Ed Miles, H. Anthony and J. F. Warren of Wichita, Kan.; Nelson Sturgis of Guthrie, Okla., and H. H. Watkins, John B. Linden and Johnson P. Renshaw of Enid, Okla.

M. S. Howe and son Charles have disposed of their interest in the Wabash Bridge & Iron Company, Wabash, Ind., to S. H. Goodman for $30,000.

Fires.

The plant of the Encaustic Metal Company, near McKeesport, Pa., was destroyed by fire last week. The company manufacture metal ceilings.

The plant of the Bay State Broken Stone Company, at Malden, Mass., was destroyed by fire October 10. Loss is $8000.

The plant of the Pacific Coast Pipe Company, at Spokane, Wash., was destroyed by fire recently. The loss is estimated at $20,000.

Hardware.

A Buch's Sons, manufacturers of farm machinery, cast and steel troughs, folding steel lawn swings, &c., Elizabethtown, Pa., have during the past year erected an entirely new plant containing all modern improvements and fitted with the latest machinery, thus enabling them to turn out the most satisfactory work. Their business during the year has increased fully 25 per cent. as compared with 1901.

Harvey D. Orr, W. D. Moore and S. D. Talbot, all of Chicago, have organized a company to be known as the Western Screen Company. The capital stock is $20,000.

F. G. Umbach, Athens, Ga., had a larger demand for his patent harrow last season than ever before. He has commenced to manufacture for next season, which begins in January, and can supply the trade from now on. He is expecting a further increase in trade on account of the high price of cotton, and will regulate his output accordingly.

The White Enamel Refrigerator Company, St. Paul, Minn., have recently purchased 23 acres of ground at Midway, between St. Paul and Minneapolis, fronting on University avenue, which is the principal thoroughfare between the Twin Cities. A brick building, 191 x 267 feet, which was on the property when purchased, is being remodeled to conform to the needs of the factory. An additional building, 64 x 200 feet, is being constructed and will be used as a warehouse. Electricity will be the motive power of the factory and all buildings will be lighted by electricity and heated by steam. The shipping and receiving of goods will be done from the Minnesota Transfer, where all railroads of the Northwest center.

The Port Huron Saw Company, Port Huron, Mich., are constructing an addition to their plant, the new building to be 96 x 100 feet, with stone foundations and fire proof siding. The plant will be equipped with modern machinery for the manufacture of long cross-cut and band saws. The business of the company required the additional facilities which are now being provided.

Syracuse Chilled Plow Company, Syracuse, N. Y., during the past year have greatly increased their manufacturing and storing facilities. They have increased their power plant by building a central power house, 54 x 66 feet, in which they have installed two Cahall boilers, 250 horse-power each, fitted with Roney automatic stokers, economizers, induced draft, all of the latest improved arrangement. Westinghouse, Church, Kerr & Co. had charge of the installation. It is the company's intention eventually to generate all their power from this central station. Their storage facilities have been increased by occupying a building which they own, but which has been rented to the American Bicycle Company for several years. This building is 84 x 180 feet, five stories high. In their blacksmith department they have added two West tire setters, a large drop hammer, a large trip hammer, a large bending machine or bulldozer, and an eye bending machine; built an addition to their tempering room, giving them three times the former facilities in this department; added several drill presses and other smaller machines. In their wood department they have added saws, planing machines and boring machines. The company advise us that for a year and a half past they have been rearranging, overhauling and increasing every weak point in their establishment, until now that they have the work nearly all finished they are in shape to turn out 25 to 50 per cent. more goods than formerly.

Miscellaneous.

The Poland Paper Company, Mechanic Falls, Maine, will build a two-story brick addition to their plant, 80 x 85 feet. No machinery will be required.

The National Trolley Mfg. Company, Rochester, N. Y., have incorporated with a capital stock of $100,000 for the manufacture of trolley wheels and appliances. The wheels are now being made by the Cowells Electric Smelting Company of Lockport, and the bearings and shafts at a new plant under the direction of F. D. Moon of Lockport, the inventor. Frederick S. Rauber, 623 Powers Building, Rochester, is acting secretary.

The Cohen Automatic Electric Block Signal Company of Allegheny, Pa., who propose to put on the market a new system of block signals, have completed their organization. George W. Cohen, the inventor of the system, was elected president and general manager; W. C. McElheny, vice-president; Charles Schneider, treasurer, and George F. Neale, secretary.

A number of manufacturing concerns are preparing to locate at West Pittsburgh, 5 miles east of New Castle, Pa. Among these are the Garland Nut & Rivet Company of Unionville, Conn., the Safety Armorite Conduit Company of Rankin, Pa., and the American Interior Conduit Company of Milwaukee, Wis., and Waukegan, Ill.

The Mitchell Wheel Company, Miamisburg, Ohio, recently incorporated with a capital stock of $100,000, have purchased an 8½-acre site, upon which they will erect a factory with a capacity of 75,000 sets of wheels per year. The plant will be equipped with automatic sprinklers and modern machinery and is expected to be ready for operation by April. Electricity will

probably be the power, the machines being operated by independent motors. The officers are N. J. Catrow, president; W. A. Mays, vice-president; Lee Mitchell, secretary, treasurer and general manager, and John V. Fornshell, superintendent of plant.

In the courts of Pittsburgh last week a petition was filed asking for dissolution of the firm of Marland, Neely & Co., Limited, of that city, manufacturers of nuts and bolts. The petition states that the concern were organized as a limited liability partnership in 1882, which expired on July 1 last. On June 30 a resolution was passed appointing Edwin Bindley, W. H. Cochrane and Thomas Neely liquidating trustees. All the indebtedness has been paid and $135,000 remains for distribution among the stockholders. It is the intention to reorganize under the name of Marland-Neely Company, an incorporation.

The Gordon Railway Joint & Nut Company, Chicago, have been organized, the incorporators being Thomas P. Magrane, Wm. W. Howe and P. A. Hines. The capital stock is $60,000.

The Backus Company, Brandon, Vt., manufacturers of portable steam radiators, are building an addition to the main factory and are enlarging their machine shop. Both buildings are 40 x 50 feet, and will increase their capacity from 10 to 25 heaters per day. They have orders on hand for about 500 heaters, and are receiving daily orders for more than they can produce.

The business of Fred. M. Locke, Victor, N. Y., manufacturer of porcelain insulators, insulator pins, &c., has been incorporated under the name of the Locke Insulator Mfg. Company, with a capital stock of $150,000. The company intend to considerably enlarge the business. The officers are Fred. M. Locke, president; Henry M. Parmele, vice-president; Willis D. Newton, secretary, and M. W. Burke, treasurer.

The American Tube Works, Boston, Mass., manufacturers of seamless drawn brass and copper tubes, are contemplating the erection of a new plant at Braintree.

Increased business has made it necessary for the Indianapolis Switch & Frog Company, Springfield, Ohio, to have more shop room, and they are preparing to move into quarters adjacent to their present works. The new plant is a brick structure, 225 x 400 feet, with railroad tracks running through it. They are now installing the engines, line shafting and electrical equipment and will probably transfer the machinery within the next 60 days.

H. Prescott Simpson, president of the Simpson Stove & Mfg. Company of Pittsburgh, has bought the property at 626 Penn avenue in that city for a consideration of $65,000. The concern now occupy the premises for offices and store room, but it is understood will replace the present structure in the spring with a modern building which they will occupy.

The Spiller Mfg. Company, Austin, Texas, have organized for the manufacture of the Spiller patent crude oil burners and stoves. The officers are L. M. Openheimer, president; H. P. Haldeman, vice-president, and C. L. Test, secretary and treasurer.

The Ephrata Wallace Plow Company have been organized at Ephrata, Pa., for the manufacture of the Wallace plow, which was formerly made at Newmanstown. The machinery and patterns will be moved to Ephrata and manufacturing started at an early date. A number of prominent business men are at the head of the enterprise, which will probably be under the direct management of W. P. Wallace.

The Gedge Bros. Iron Roofing Company, Anderson, Ind., have completed an addition 40 x 150 feet to their plant, which will be used for the manufacture of galvanized stock tanks, cornices, skylights, &c., and which is equipped with the latest and best machinery. They are so crowded for space that they contemplate further enlargements of their plant, which, however, will probably not be made before next spring.

Detroit people have purchased an interest in the Ohio Automobile Company of Warren, Ohio, and the plant will probably be removed to Detroit. The new company will have a capital stock of $500,000. The Detroit men in the company are Russell A. Alger, Jr., Fred M. Alger, John S. Newberry, Truman Newberry, H. B. Joy, R. P. Joy, Chas. A. Ducharme, D. M. Ferry, Wm. C. McMillan, Philip H. McMillan, and Joseph Boyer. The Packard Bros., who have been at the head of the concern heretofore will remain in the enterprise and the concern will bear their name.

The American Motor Carriage Company of Cleveland have been incorporated at Wilmington, Del., with a capital stock of $500,000. Incorporators: Frank H. Ginn, Albert E. Green and J. M. Garfield. The company will manufacture gasoline and electric automobiles. They have an experimental plant in Cleveland and have purchased a site for a large factory which will be erected at once.

The Hoffman Automobile Mfg. Company of Cleveland have organized with the following directors: Daniel Shormer, T. F. Newman, A. D. McLachlan, L. E. Hoffman, A. T. Hatch, F. S. Masten and E. D. Shumer. The directors have elected officers as follows: President, E. D. Shurmer; vice-president and general manager, L. E. Hoffman; secretary, T. F. Newman, and treasurer, A. D. McLachlan. The company have purchased the plant of the Hoffman Bicycle Company, and will employ 150 men this winter in the manufacture of steam and gasoline automobiles.

McClintic-Marshall Construction Company.—The McClintic-Marshall Construction Company of Pittsburgh, with works at Rankin, Pa., and Pottstown, Pa., have recently taken some large contracts for structural work. Among these are the ore and coke bins of the Union Steel Company, at Donora, Pa., about 6000 tons, and a large viaduct for the Pittsburgh Railways Company, at North Wilmerding, across the tracks of the Pennsylvania Railroad. It will be about 1500 feet long and will require about 600 tons. Also new steel buildings for the Standard Tin Plate Company, at Canonsburg, Pa., requiring about 500 tons. All this work will be built at the Rankin shops. The Pottstown works of the McClintic-Marshall Construction Company have taken contracts for new steel buildings of the Ingersoll-Sergeant Drill Company, Easton, Pa., involving about 700 tons.

Carnegie Officials on an Inspection Trip.—On Tuesday morning, October 14, a number of leading officials of the American Steel Hoop Company and National Steel Company, left Pittsburgh to make an inspection of some of the mills of these two concerns. Included in the party were W. E. Corey, A. C. Dinkey, A. R. Hunt, Charles McKillips, Homer J. Lindsay, I. W. Jenks, W. B. Dickson and Charles W. Baker. The party inspected the plants at Greenville, Sharon and New Castle on Tuesday, Warren, Youngstown and Girard on Wednesday, Bellaire and Mingo Junction on Thursday, and expect to return to Pittsburgh Thursday night.

J. C. Gilchrist of Cleveland has placed contracts for three more 6500-ton ships, making ten boats of this class for which he has closed contracts during the past three weeks. Two of the steamers will be built by the American Shipbuilding Company and the third contract went to the Columbia Iron Works of St. Clair. The ten boats will be duplicates and will cost upward of $250,000. Eight of them will be turned out at the yards of the American Shipbuilding Company and the St. Clair firm will build the other two. The vessels will be 436 feet over all, 410 feet keel, 50 feet beam and 28 feet deep. They will have triple explansion engines with cylinders 22, 35 and 58 inch, with 40-inch stroke. Steam will be furnished by Scotch boilers 13 feet 2 inches in diameter and 11½ feet long. They will have Ellis & Eaves forced draft. The two steamers which will be built by the Columbia Iron Works will come out next July. The new contracts for the Cleveland concern give them a total of 38 vessels under contract, with a value of $8,580,000. With this order Mr. Gilchrist will have 80 ore carrying vessels, most of which have been purchased within the last three or four years.

Norman B. Livermore & Co. of 320 Sansome street, San Francisco, Cal., have been appointed sole agents for the Scaife and We-Fu-Go water softening and purifying systems for the Pacific Coast by Wm. B. Scaife & Sons Company of Pittsburgh, who are the sole manufacturers of these systems. Norman B. Livermore, the senior partner, is an engineering graduate of Cornell University. After a number of years in general practice he organized the firm to conduct a general engineering business and to act as sales agents for special lines on the Pacific Coast. They will give the subject of water purification their special attention.

At Uniontown, Pa., a deed has been filed covering the sale of 1012 acres of coking coal lands in the Masontown field, by Frank J. Hearne, to the National Tube Company, the consideration being $910,800. It is said Mr. Hearne bought this property some years ago at $160 an acre. Mr Hearne was formerly president of the National Tube Company, but resigned some time since and was succeeded by William B. Schiller.

The Iron and Metal Trades.

The fuel situation continues exceedingly troublesome in all parts of the country, not alone in its direct effect upon manufacturing operations, but also in its adverse moral effect upon business generally. In the Central West deliveries of Coke are very unsatisfactory. In the South the strike in the New River district stubbornly continues, and while the Pocahontas field is at peace the shipments are unsatisfactory. In Alabama the trouble between the Tennessee company and the miners will probably be settled to-day. From the Lehigh Valley comes the report that the furnaces are now getting a little Anthracite, but the opinion prevails that in the most favorable case the manufacturing industries will not be taken care of until the domestic requirements are fairly well provided for.

Fancy prices are being paid for Coke for prompt delivery, and $4 and upward has been paid for blast furnace Coke well into next year, some furnacemen covering on sales for distant delivery of Pig.

But what after all most interests those who are consumers of Coke is what the prices are to be for next year. As yet this matter has not been settled, although the feeling is that an advance of $1, to $3.25, at oven, Connellsville, seems certain, if in fact it is not considerably higher. It is understood that a very large sale of Bessemer Iron for the second and third quarters of 1903, involving several hundred thousand tons, is kept pending until the question of Coke prices is settled.

There has been some movement in Basic Pig, Virginia furnaces having sold about 15,000 tons at $19 to $20, at furnace.

The rush for Coal charters in England has so hardened freights that it is making imports of foreign Pig Iron a little more difficult.

The difficulties over the duty on Steel Billets have stopped all negotiations for foreign Steel for the present.

It is not generally realized how close to the line the official valuations of steel billets are. As we understand it the importers seem to have purchased steel billets at prices ranging from 65 marks at German steel works and upward to 72 marks at different times. The appraisers have advanced these to 95 and up to 96½ marks for billets and 97 marks for slabs. Now, if it were shown that even the German domestic market was below 93 marks at steel works, then the steel billets and slabs would come in under the old rate of duty. It is contended by some importers that the German domestic market price, even if it is 95 to 97 marks, would refer to delivery at consumer's plant, so that it would be necessary to deduct the freight from the steel works, varying from 5 to 10 marks, to arrive at the market price at the steel works. Thus clearly the valuation, even on the basis of the German domestic selling prices, would be inside of the figure which would entitle the billets to entry at the rate of 0.3 cent per pound.

Reports from the heavy lines continue exceedingly satisfactory. There have been further large sales of Steel Rails, with additional business pending. Heavy transactions have taken place in Plates and a very good tonnage is coming out in Structural Material.

In the lighter lines the sharp struggle continues. The principal outside mills are freely meeting the cuts on Wire products and on Sheets. It is worthy of note as bearing upon the all important point of current consumption that the sales are reported to be heavy.

There is increasing weakness in Merchant Pipe, notably in the smaller sizes. The feeling prevails in the trade that an adjustment in prices cannot be far off, and this, too, is expected in the Tin Plate trade.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

At date, one month and one year previous.

	Oct. 15, 1902.	Oct. 8, 1902.	Sept. 17, 1902.	Oct. 16, 1901.
PIG IRON:				
Foundry Pig No. 2, Standard, Philadelphia	*22.00	*$22.00	*$22.00	$15.00
Foundry Pig No. 2, Southern, Cincinnati	***22.25**	*22.25	*21.75	13.75
Foundry Pig No. 2, Local, Chicago	*23.00	*23.00	*23.00	14.75
Bessemer Pig, Pittsburgh	*21.75	*21.75	*21.75	15.85
Gray Forge, Pittsburgh	*20.50	*20.50	20.75	14.15
Lake Superior Charcoal, Chicago	*26.00	*26.00	26.00	17.00
BILLETS, RAILS, ETC.:				
Steel Billets, Pittsburgh	31.00	†29.00	†29.00	26.00
Steel Billets, Philadelphia	†**27.50**	†27.00	†26.50	....
Steel Billets, Chicago	....	†30.00	†30.00	....
Wire Rods, Pittsburgh	36.00	35.50	36.00	34.50
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL:				
O. Steel Rails, Chicago	19.00	19.00	19.00	14.00
O. Steel Rails, Philadelphia	21.50	21.50	21.50	17.50
O. Iron Rails, Chicago	25.00	25.00	25.00	21.00
O. Iron Rails, Philadelphia	**25.00**	25.00	24.00	19.00
O. Car Wheels, Chicago	**22.50**	22.50	21.00	16.00
O. Car Wheels, Philadelphia	*19.00*	19.50	20.00	16.50
Heavy Steel Scrap, Chicago	18.50	18.50	18.50	13.50
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	1.95	1.92½	1.92	1.60
Common Iron Bars, Chicago	*1.80*	1.80	1.90	1.70
Common Iron Bars, Pittsburgh	1.80	1.80	1.80	1.55
Steel Bars, Tidewater	*1.80*	1.80	2.00	1.62½
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.50
Tank Plates, Tidewater	**2.10**	2.00	2.00	1.75
Tank Plates, Pittsburgh	**1.90**	1.75	1.75	1.60
Beams, Tidewater	2.15	2.10	Nom.	1.75
Beams, Pittsburgh	2.00	Nom.	Nom.	1.60
Angles, Tidewater	2.15	2.10	Nom.	1.75
Angles, Pittsburgh	2.00	Nom.	Nom.	1.60
Skelp, Grooved Iron, Pittsburgh	2.00	2.00	2.02½	1.90
Skelp, Sheared Iron, Pittsburgh	2.10	2.10	2.10	2.00
Sheets, No. 27, Pittsburgh	*2.65*	2.65	2.85	3.15
Barb Wire, f.o.b. Pittsburgh	*2.50*	2.50	2.90	2.90
Wire Nails, f.o.b. Pittsburgh	*1.90*	1.90	2.05	2.30
Cut Nails, Mill	2.05	2.05	2.05	2.05
METALS:				
Copper, New York	11.70	11.55	11.70	16.85
Spelter, St. Louis	**5.25**	5.25	5.15	4.10
Lead, New York	4.10	4.10	4.10	4.37½
Lead, St. Louis	4.00	4.00	3.97½	4.25
Tin, New York	*25.50*	25.00	26.35	24.85
Antimony, Hallett, New York	7.75	7.75	8.00	8.50
Nickel, New York	40.00	40.00	40.00	60.00
Tin Plate, Domestic, Bessemer, 100 lbs., New York	4.19	4.19	4.19	4.19

* For 1903. † Foreign.

Chicago.

FISHER BUILDING, October 15, 1902.—(*By Telegraph.*)

The prominent features of the week have been the continued strength of Pig Iron and Steel Plates, the large sales of Steel Rails for next year's delivery and the emphasized weakness in Light Sheets and Merchant Pipe. The further buying of Structural Material by bridge works and larger sales for buildings within the city limits have also been points of interests and prominence. Bars, both Iron and Steel, have developed an easier tendency, and it is notable that small sizes of rounds and flats can be supplied much more readily than heretofore. A few grades of Old Material have been less strong because of lighter buying by consumers, but otherwise the market has been quite firm, with moderate offerings.

Pig Iron.—Aside from the prospect of an early settlement of the Anthracite Coal strike and its attendant difficulties, the developments during the past week have tended toward a strengthing of the market rather than otherwise. There has been no increase in the supply of Coke; on the contrary, the famine has been effective in reducing the output of Pig Iron both in the North and South. One more local furnace has been compelled to bank, and another stack is reported to be on the verge of blowing out or banking within the next few days. More and more reliance is being placed on foreign metal, but the effect of an increased supply in the East has been rather to turn a more ample supply of domestic Pig Iron in this direction. The higher ocean freight rates and the difficulty in obtaining ample vessel room seem to point to higher prices and a less ample supply of foreign material, however, in the very near future, which is not without its influence even as far West as Chicago. The lat-

est information from the Alabama district is that the Sloss and Republic interests have succeeded in making terms, which will prevent an extension of the strike which now affects the Tennessee Coal & Iron Company's furnaces. The selling interests in this market best informed on the situation are strongly of the opinion that this will be what may be termed a "squeeze on spot" Pig Iron between the present and the first of next year. On the other hand, melters who have covered their requirements and would receive the Iron purchased under normal circumstances have not as yet given up hope of receiving an ample supply to protect their plants against idleness during the current year. The outlook at present, however, appears to be against the interests of the consumers of Pig Iron. Sales during the week while relatively small have been quite considerable under the circumstances. In all about 15,000 tons have been sold, one-half of which is probably for delivery during the first six months or the second quarter of 1903, the balance being for delivery during the next two months, several thousand tons of which will probably be delivered during the current month. The Iron being sold is nearly all of Foundry grades, although there have been some sales and resales of Bessemer Iron. The prejudice which has been entertained against Scotch, German and English brands is disappearing somewhat with a closer acquaintance with the foreign Iron, and sales have been more readily effected. Of the domestic Iron selling, Virginia and Tennessee brands have been in largest proportion, but there have been some sales of local and Alabama Irons also. No. 1 Foundry domestic Iron has sold at $27.65 to $28, No. 2 at $26.50 to $27.15 and No. 2 foreign Iron mainly at $26.50 spot. The latest sale reported was that of 1000 tons of No. 2 Foundry for delivery during November and December of this year. Iron running high in silicon, ranging from 3 to 8 per cent., has been in less ample supply and is bringing a slight advance, ranging from $29.40 to $31.40 for early delivery. The sales for next year's delivery have been made on the basis of the following quotations, which are given for delivery during the first half of 1903:

Lake Superior Charcoal	$26.00 to $27.00
Local Coke Foundry, No. 1	23.50 to 24.00
Local Coke Foundry, No. 2	23.00 to 23.50
Local Coke Foundry, No. 3	22.50 to 23.00
Local Scotch, No. 1	24.00 to 24.50
Ohio Strong Softeners, No. 1	25.50 to 26.50
Southern Silvery, according to Silicon	24.10 to 24.50
Southern Coke, No. 1	24.15 to 24.65
Southern Coke, No. 2	23.65 to 24.15
Southern Coke, No. 3	23.15 to 23.65
Southern Coke, No. 1 Soft	24.15 to 24.65
Southern Coke, No. 2 Soft	23.65 to 24.15
Foundry Forge	22.15 to 22.65
Southern Gray Forge	21.65 to 22.15
Southern Mottled	21.65 to 22.15
Southern Charcoal Softeners, according to Silicon	27.15 to 27.65
Alabama and Georgia Car Wheel	27.00 to 27.50
Malleable Bessemer	24.00 to 25.00
Standard Bessemer	25.00 to 26.00
Jackson County and Kentucky Silvery, 6 to 9 per cent. Silicon	27.60 to 28.60

Bars.—There have been few large orders on the market, but a number of carload lots have sold on the basis of 1.80c. to 1.85c., Chicago, and negotiations are pending on lots of 500 tons at the inside price for early delivery. Inquiries are being received from the East, which is an unusual occurrence in this market. There has been some little increase in the specifying for Soft Steel Bars, but the volume of new business has shown but little improvement. The market seems to be less strong, with the mills prepared to make prompter shipments than for some time. There has also been some specifying on Hoops and better inquiry from coopers. The following are the prices current: Soft Steel Bars, 1.75c. to 1.85c.; Hoops, 2.15c. to 2.25c.; Angles, 1.85c. to 1.95c., base, mill shipment. There has been a moderate order demand from store and the market for Bar Iron is somewhat easier, with sales at 2.15c. Soft Steel Bars are sold at 2c. to 2.25c., Angles at 2.50c. and Hoops at 2.40c. to 2.50c. from store.

Structural Material.—There has been a good demand for bridge work, contracts covering about 6000 tons having been placed during the week for deliveries ranging from 60 days to six months, according to sizes. There has also been a fair demand from contractors, one lot of 4000 tons for the Armour Office Building at the stock yards having been sold from stock during the week. Bids have been taken on a local warehouse to be constructed soon, calling for about 6000 tons, but as yet the contract has not been awarded. Mills are prepared to make prompter shipments on small sizes of Beams, Channels and Angles, but large sizes are as difficult to obtain as ever. Little is heard of foreign material since the advance in freight and the difficulty of obtaining steamer room, and prices for such Steel are entirely nominal. The prices current for domestic Steel, mill shipment, are as follows: Beams, Channels and Zees, 15 inches and under, 1.75c. to 1.90c.; 18 inches and over, 1.85c. to 2c.; Angles, 1.75c. to 1.90c. rates; Tees, 1.80c. to 1.90c.; Universal Plates, 1.75c. to 1.85c. There is a good demand for shipment from local stocks, which seem to be better than for some time past. The following are the prices current: Beams and Channels are selling at 2.50c. to 3.50c., Angles at 2.50c. to 3.50c. and Tees at 2.55c. to 3.50c. at local yards.

Plates.—The market continues strong, with an active demand and sales of about 14,000 tons, a large portion of which is for two steamers to be built for works at South Chicago. The following are the prices current: Tank Steel, ¾-inch and heavier, 1.75c. to 2.25c.; Flange, 1.85c. to 2.35c.; Marine, 1.95c. to 2.50c. The active demand for small quantities for immediate shipment from local stock has continued, and the following prices are readily obtained: Tank Steel, ¼-inch and heavier, 2.30c. to 2.50c.; Tank Steel, No. 8, 2.35c. to 2.55c.; Flange, 2.45c. to 2.65c., all f.o.b. warehouse, Chicago.

Sheets.—Keen competition has continued to keep the market somewhat unsettled, especially on small sizes of Galvanized, which are reported to have sold as low as 75 and 10 and 3 to 75 and 10 and 5 for mill shipment on the base price. The jobbing demand has continued fair, and readily met from local stocks, which are quite full. Prices are as follows: No. 20 Black Sheets sell at 2.60c. to 2.65c. and No. 27 at 2.80c. to 2.85c., mill shipment. For small lots from store 3.10c. to 3.20c., Chicago, is obtained. Galvanized Sheets are selling at 3.35c. to 3.40c. net, mill shipment, while small lots are selling at 3.80c. to 4c. net, from store, for No. 27. Sales which are not made at net prices command discounts ranging from 70 and 10 and 5 to 75 and 10 and 5 on the base price, according to special circumstances governing individual transactions.

Cast Pipe.—With the advance of the season municipal contracts are smaller and fewer. The contract pending at Findlay, Ohio, was not awarded. About 4000 tons for the World's Fair at St. Louis was placed during the week. Manufacturers note that on smaller sizes, such as 4's, 6's and 8's, they are sold up to capacity until December. There is a fair inquiry from smaller consumers, railroads and private companies, and the market continues firm. Manufacturers sell small lots as follows: 4-inch, $37; 6-inch, $36; 8-inch and upward, $35; Gas Pipe, $1 per ton higher, all f.o.b. Chicago.

Billets.—The increased duty demanded on foreign Billets, higher freight rates and less vessel room have militated against business of this character, and prices for the present are entirely nominal. There has been a fair demand for domestic Open Hearth Billets at prices ranging from $36 to $38, and negotiations for several thousand ton lots are pending. Four hundred tons of Basic Billets, special analysis, were sold at $38.25 at mill, and jobbing sales made as high as $40, Chicago.

Merchant Pipe.—The market has continued slow and easy, keen competition keeping prices at a low level, due to the increased discounts made on desirable business. The following are the prices current, random lengths, Chicago: Black, ⅛ to ½ inch, 56½ off; ¾ to 12 inches, 63½ off; Galvanized, ⅛ to ½ inch, 43½ off; ¾ to 12 inches, 50½ off. Some manufacturers are making the following prices for mill shipments, Chicago: Random lengths, Black, ⅛ to ½ inch, 60 off; ¾ to 12 inches, 67 off; Galvanized, ⅛ to ½ inch, 48 off; ¾ to 12 inches, 56 off.

Boiler Tubes.—The market has been without animation, and the tone has been easy, in sympathy with Merchant Pipe. The following are the prices current for mill shipment:

	Steel.	Iron.
1 to 1½ inches	43½	40½
1¾ to 2½ inches	56	38½
2¾ to 5 inches	61	48½
6 inches and larger	56	38½

There has been but little order demand for small lots from store, and while prices are without essential change concessions are made in some instances on desirable business. We quote:

1 to 1½ inches	35	35
1¾ to 2½ inches	47½	32½
2¾ to 5 inches	55	42½
6 inches and larger	47½	..

Merchant Steel.—Shipments on previous contracts have continued liberal, but new contracts taken have not been worthy of special comment other than for Crucible Steel, for which there has been quite an active demand and some liberal contracts taken, but lower grades of Tool Steel have sold as low as 6c. during the week. For mill shipment prices are as follows: Smooth Finished Machinery Steel, 2c. to 2.10c.; Smooth Finished Tire, 1.95c. to 2.10c.; Open Hearth Spring Steel, 2.65c. to 2.75c.; Toe Calk, 2.25c. to 2.40c.; Sleigh Shoe, 1.85c. to 1.90c.; Cutter Shoe, 2.40c. to 2.60c.; Cold Rolled Shafting, 47 off in carload lots and 42 off in less than car lots. Ordinary grades of Crucible Tool Steel are quoted at 6c. to 7c. for mill shipment; specials, 12c. upward.

Rails and Track Supplies.—The demand for both Heavy and Light Sections has continued active, and several important contracts have been taken and others of moment are pending. Sales of small lots have aggregated between 18,000 and 20,000 tons, taken by both Western and Eastern mills, and one lot of 50,000 tons has been placed with the Carnegie Company through St. Louis for delivery during the first half of 1903. Local mills have sold the current production of Light Rails for several months in ad-

vance, and independent mills are overwhelmed with orders for Light Sections which they cannot meet, one mill having inquiries for small lots aggregating about 20,000 tons during the past few days. Official prices have continued strong at $28 for Standard and $27 for Second Quality, mill shipment. Lighter Sections range from $32 to $38 in carload lots, according to weight and time of delivery, while smaller quantities command a premium of $3 to $5 per ton. Track Supplies have continued active and the market strong at full prices, which are as follows: Splice Bars or Angle Bars, 2c.; Spikes, 2.50c.; Track Bolts, with Hexagon Nuts, 3.10c. to 3.45c.; Square Nuts, 2.95c. to 3.10c.

Old Material.—The market has been less strong on Railroad Wrought, Iron Rails and Heavy Steel Melting Scrap, there being a less active demand and more ample offerings by railroads, but other grades have been well maintained. Car Wheels are especially scarce and wanted, and would probably command higher prices than quotations. Agricultural Malleable is also stronger and somewhat higher. Other grades are without special change. There have been sales of 1000 tons of Relaying Rails at equivalent to $32, Chicago. The following are the prices current per gross ton, Chicago:

Old Iron Rails	$25.00 to $25.25
Old Steel Rails, mixed lengths	19.00 to 19.25
Old Steel Rails, long lengths	23.50 to 24.50
Heavy Relaying Rails	32.00 to 32.50
Old Car Wheels	22.50 to 23.00
Heavy Melting Steel Scrap	18.50 to 18.75
Mixed Steel	15.50 to 16.00

The following quotations are per net ton:

Iron Fish Plates	$22.50 to $22.75
Iron Car Axles	25.00 to 26.00
Steel Car Axles	23.50 to 24.00
No. 1 Railroad Wrought	21.25 to 21.75
No. 2 Railroad Wrought	.... to 19.00
Shafting	20.00 to 21.00
No. 1 Dealers' Forge	17.50 to 18.00
No. 1 Busheling and Wrought Pipe	15.00 to 15.50
Iron Axle Turnings	15.00 to 15.50
Soft Steel Axle Turnings	14.50 to 14.75
Machine Shop Turnings	14.25 to 14.75
Cast Borings	10.25 to 10.75
Mixed Borings, &c.	10.50 to 11.50
No. 1 Boilers, cut	14.50 to 15.00
Heavy Cast Scrap	17.00 to 17.50
Stove Plate and Light Cast Scrap	12.50 to 13.00
Railroad Malleable	16.25 to 16.75
Agricultural Malleable	16.00 to 16.25

Metals.—The Copper market has been without special activity and fluctuations in prices have been narrow. Lake is held at 12c. in car lots and 12¼c. to 12¾c. in a jobbing way. Pig Lead has met an active demand and continued firm at 4.05c. in 500-ton lots, 4.07½c. in car lots and 4.10c. in a jobbing way. Sheet Zinc has been steady at 6½c. in carload lots and 6.65c. in lots of 600 lbs. Old Metals have been moderately active, with Heavy Cut Copper a little easier, while Red Brass has been stronger, which is notable because contrary to the general tendency of the market. Heavy Cut Copper, 10½c.; Red Brass, 10⅝c.; Copper Bottoms, 9½c.; Lead Pipe, 3.90c., and Zinc, 3.75c.

Coke.—The market is very strong, there being still an inadequate supply, and the little offered on track selling at $14 per ton, Chicago. Some few contracts have been made for next year's delivery on the basis of $3.50 to $4 at the ovens. Deliveries on track have been very small.

David Evans, representative of the Sloss-Sheffield Steel & Iron Company in this section, announces that he has secured the sale in the Chicago territory of the product of the La Follette Coal, Iron & Railway Company, La Follette, Tenn. The furnace of the company went into blast October 7.

St. Louis.

CHEMICAL BUILDING, October 15, 1902.—(*By Telegraph.*)

Pig Iron.—Business executed in the market for Pig Iron the past week has not been of a heavy order, and the majority of commitments have been for 1903 delivery. No. 2 Foundry and Car Wheel Irons have been the grades composing most of these requirements. The special stringency of material on account of the strike in the Coal mining industry of the South continues, and among the consumers drawing their supply from this point the condition has been a hard one to successfully face. A basis of $20, Birmingham, for No. 2 Foundry for 1903 delivery is the minimum, and present sales are very general at this figure. We quote, f.o.b. St. Louis, as follows:

Southern, No. 1 Foundry	$24.25 to $28.75
Southern, No. 2 Foundry	23.75 to 27.75
Southern, No. 3 Foundry	23.25 to 26.25
Southern, No. 4 Foundry	22.75 to 25.75
No. 1 Soft	24.25 to 26.75
No. 2 Soft	23.75 to 25.75
Gray Forge	22.75 to 24.75
Southern Car Wheel Iron	.... to ....
Malleable Bessemer	.... to ....
Ohio Silvery, 8 per cent. Silicon	.... to ....
Ohio Strong Softeners, No. 1	.... to ....
Ohio Strong Softeners, No. 2	.... to ....

Bars.—Jobbers report recent demand improved, and conditions generally in the market for Iron and Steel Bars are along satisfactory lines. We quote from the mills: Iron Bars at 1.85c. and Steel Bars at 1.80c. to 1.95c. Jobbers quote Iron Bars at 2.25c. and Steel Bars at 2.25c.

Rails and Track Supplies.—The prevailing tone and general conditions in the market for Rails and Track Supplies are unchanged. We quote as follows: Splice Bars at 2.10c.; Bolts, with Square Nuts, at 3c. to 3.10c.; Hexagon Nuts, 3.25c. to 3.30c., and Spikes at 2.50c. to 2.60c.

Angles and Channels.—The jobbers report a slightly better demand for Angles and Channels, with price conditions ruling as before. For material of this class 2.50c., base, from store is asked.

Pig Lead.—Conditions of demand and prices show no change, and quotations continue, Chemical at 4c. to 4.02½c. and Desilverized at 4.05c.

Spelter.—The very good demand still shows in the market for future supplies of Spelter, and what little spot metal is to be had at this time finds a ready purchaser. Quotations of 5.25c. for futures is asked at this time.

Philadelphia.

FORREST BUILDING, October 14, 1902.

Assuming that the strike in the Anthracite region is at an end, the question is, What next? Attention has been concentrated on this special feature to such an extent that other important considerations have been lost sight of. The resumption of work and the immediate relaxation of public anxiety is a great thing, but it will be a long time before matters can be straightened out and even a semblance of normal conditions established. A careful survey will have to be made of all the surroundings and such adjustments made as may be deemed necessary for the changed conditions. It is impossible to say how much damage has been done to the business situation, how long it will take to repair it, or to what extent repairs are possible. The mere fact of a resumption of mining will be of comparatively little benefit to the manufacturing interests for a long time to come. The greatest relief will be to the retail dealers and householders. It will be physically impossible to do very much for large consumers, as the roads are already congested with traffic, and will be still more so when shipments of Coal begin to be made for the retail trade. The shortage since the beginning of the strike is estimated at over 6,000,000 tons, and if even half of that must be made up by the end of January the chances for large consumers are not particularly hopeful. Moreover, the crops must be moved, and as the financial situation is largely dependent on exports, the needs in this respect are very urgent. These are not fanciful ideas, but facts, and if it is desirable to size up the situation correctly matters of this kind cannot be ignored. Some slight improvement may be made, but for reasons mentioned it will be a long time before normal conditions can be established. Fuel ought to be very much cheaper, however. If the railroads find their facilities overtaxed it is no reason for advancing the price of Coke every day or two, and it is no reason for reconsigning it two or three times before it reaches its final destination, but this has been no unusual thing during the past few weeks. Coke that was shipped on a basis of $7 or $8 a ton has been reconsigned in some cases two or three times, at $1 or $2 per ton advance each time. This kind of business, however, has been stopped, as the railroads have issued notices that no reconsignments will be permitted after this date. Some large concerns have shut down for want of fuel, others are just hanging on the ragged edge, others are bringing Coke from Europe—one, the Prizer-Painter Stove Company of Reading, have part of a cargo due in course of a few days, while others have the matter under advisement. As regards Pig Iron, there will probably be less difficulty in getting supplies than there was during the summer months. Consumption cannot increase without an increase in the fuel supply, and besides foreign Iron is in such general use that the demand for American has fallen off considerably. It is now purely and simply a matter of price. At $21.50 to $23.50 for English, Scotch and Westphalian Irons there is no great inducement to substitute American Irons, unless at pretty nearly similar prices. Anxiety as regards Pig Iron is therefore greatly abated. The question of the relative condition of business compared with what it was two or three months ago is a difficult problem. It is very desirable to take new soundings and new observations before coming to definite conclusions on that point. The crops are good, though not near as good as was figured on a few weeks ago, but they are good enough to dispel all uneasiness on that score. The financial situation appears to have been greatly overrated by those who are supposed to be practically infallible on that point. If they are infallible, the calling in of loans and the high rates for both short and long time loans indicate gradual liquidation, and that means restriction of business. The recent reduction in prices made by the leading Steel interests in various departments is a similar indication, and in other ways that might be mentioned con-

servative methods appear to be more general than they have been for a long time past. This, however, will prevent anything like a sudden collapse, which indeed would be hardly possible in the Iron trade, seeing that there are no stocks of any kind to be realized on. Everything has been cleaned up to the last pound, so that anything wanted a month hence, or in many cases three months hence, must be produced some time in the interim, as there is nothing left over. Business may fall off a little and prices may go a little lower, but sudden or violent changes appear to be out of the question.

Pig Iron.—There is no perceptible change in the Pig Iron situation. Local furnaces are nearly all banked or preparing to bank unless more and cheaper Coke can be had, as it is impossible to run under existing conditions, unless at a cost which is prohibitory. The supply of foreign Iron is so satisfactory, however, that consumers are pretty well reconciled as far as that goes, although most people realize that conditions are more or less temporary, yet as regards prices no material change is pending in the immediate future. Stocks are too low and cost of production too high to permit of a decline; while the supply of foreign Iron is too large to permit of an advance. Higher prices are quoted from foreign markets, but this is mostly due to higher freights, which in turn are due to heavy engagements for shipments of Coal to this country. There is very little danger of higher prices for foreign Pig Iron, however, as they are in constant fear of a decrease in the American demand, and would therefore sacrifice something to retain it. Any advance in freights would therefore be pretty sure to be offset by a corresponding decline in price, so that the effect in the c.i.f. prices would be fully equalized. Sales have not been particularly important, just enough to provide for requirements during the remainder of the year, with very little interest in long date engagements. It is difficult to give exact quotations when there are so many new Irons in the market, and when so many different kinds of deliveries have to be made. Foreign Iron, however, in broken lots alongside ship, duty paid, may be quoted as follows—cargo lots $1 to $1.50 less:

Low Phosphorus	$22.00 to $22.50
East Coast Bessemer	21.50 to 22.00
No. 3 Middlesbro	20.50 to 21.00
Scotch, No. 1	22.50 to 23.50
Scotch, No. 3	21.00 to 21.50
Westphalian, No. 2, Plain	20.50 to 21.25

American brands for city or nearby deliveries during the first half of next year may be quoted as follows, and $1 to $1.50 more for this year's deliveries:

No. 1 X Foundry	$23.50 to $24.50
No. 2 X Foundry	22.00 to 22.50
No. 2 Plain	21.00 to 22.00
Standard Gray Forge	19.50 to 20.50
Basic	20.50 to 21.00

Billets.—There is considerable inquiry for Steel, but it is a difficult matter to bring buyers and sellers to agree upon terms. Buyers fear to touch foreign Steel since the disagreement in regard to duties, but American Steel is so much dearer that it is difficult to close sales of that article. Prices are said to be about $27.50 for foreign Steel, and $32.50 to $33.50 for American. These figures cannot be said to represent sales actually closed, but are believed to fairly represent what sellers would be willing to accept.

Plates.—There is quite an urgent demand for Plates, and as most of the Eastern mills are hampered by insufficient supplies of fuel the output is considerably below the normal. Prices are therefore very strong, and 2c. at mill is the best that can be done on the most desirable class of orders. The demand for Plates for delivery during the first quarter of next year is also very heavy, but manufacturers are not showing much anxiety for business so far ahead, although a fair proportion has been entered. Quotations same as last week, but the tone is very strong—viz.: Small lots, 2.10c. to 2.15c.; carload lots, ¼-inch and thicker, 2c. to 2.05c.; Universals, 2c. to 2.05c.; Flange, 2.10c. to 2.20c.; Fire Box, 2.25c. to 2.30c.; Marine, 2.30c. to 2.35c.; Charcoal Plates, C. H. No. 1, 2½c.; C. H. No. 1 Flange, 3c.; C. H. No. 1 Flange Fire Box, 3½c.

Structural Material.—The situation is a little mixed as regards prices, but there is plenty of business to be had. Imported material commands 2.15c. to 2.25c. for good sized lots and mill specifications up to 2.50c., but all depends on what may be wanted, and what there is at hand to make the delivery. So-called official quotations are 1.72c., but as there is nothing definite as regards deliveries the quotation has no great significance.

Bars.—The demand is only fair, but as the mills have been short of fuel, the output has been somewhat restricted, so that there has been no oversupply. The situation is a little unsettled, however, and it would not be difficult to place large orders at the inside figures, providing that deliveries were somewhat extended. Prompt shipments command 1.95c. to 1.97½c. for carload lots as a minimum quantity, and Steel Bars 2c. to 2.10c. for prompt shipments and 1.8c. to 1.9c. for long dates.

Old Material.—The suspension of work at many of the mills owing to a scarcity of fuel has cut short the deliveries of Scrap, so that prices are easier and more or less nominal. Holders are anxious to realize, and for the time being the market has a decidedly weak appearance. The general market is indicated by the following for lots delivered in buyers' yards:

Old Steel Rails	$21.50 to $22.00
Heavy Steel Scrap	20.50 to 21.25
Low Phosphorus Scrap	26.50 to 27.50
Old Steel Axles	26.00 to 27.00
Old Iron Rails	25.00 to 26.00
Old Iron Axles	30.00 to 31.00
Old Car Wheels	19.00 to 20.00
Choice Scrap, R. R. No. 1 Wrought	23.50 to 24.50
Country Scrap	20.00 to 21.00
Machinery Cast	19.50 to 20.00
No. 2 Light Scrap	17.00 to 18.00
No. 2 Light (Ordinary)	14.50 to 15.00
Wrought Turnings	16.00 to 17.00
Wrought Turnings, Choice Heavy	18.00 to 18.50
Cast Borings	10.00 to 10.50
Stove Plate	15.50 to 16.00

J. B. Lequear, late secretary of the Duncannon Iron Company, died on September 20, after an illness of about five weeks. He served as secretary of the company for about two years, and was with the company altogether about 11 years, during which time his services were highly appreciated. W. L. Coover, who has been elected as secretary, was an employee at Duncannon, and has been with them about 15 years. He will have his headquarters at the office of the company, 122 Race street, Philadelphia, Pa.

Cincinnati.

FIFTH AND MAIN STS., October 15, 1902.—(*By Telegraph.*)

The situation in Pig Iron circles at present may be characterized as dull, except for the usual trouble routine, which appears to be entailed upon the business just at present. The labor difficulties in the South, while they are understood to be eliminated as far as some of the furnaces are concerned, are active factors in the output of a large number, and are adding their weight to the Coke and Ore situation so as to indictate restriction of production. The entrance to the market of the new Southern furnace appears to have settled the varying prices for spot delivery in a decided manner, and Iron which was quoted in straggling lots and minute quantities on the basis of $22, Birmingham, for No. 2 Foundry appears to be out of the way altogether, and so far as No. 4 Foundry and No. 2 Soft grades are concerned the basis is that of $23, Birmingham, for No. 2, or the maximum quotations which were published last week. There is still some dispute as to the value of Gray Forge, and the ideas are separated about $1.50 per ton. Sales are reported on the basis of as high as $18, Birmingham, though the general idea is from $16.50 to $17.25, Birmingham. Iron for next year's delivery is getting to be about as scarce, as far as the first quarter is concerned, as it is for the balance of this year, and there is now practically no Iron of Southern grade being offered for 1903 delivery. The general idea, however, as to value is that there is nothing to be had or likely to be had on a less basis than $20, Birmingham, for No. 2. In this connection comes the question of the classification of Virginia Iron. These Irons are claimed to be practically Southern Irons, and are quoted in this market by some agents on Birmingham basis; that is to say, on the basis of $22.25, f.o.b. Cincinnati, which would be equivalent to $19, Birmingham. There is still some of this Iron offered on that basis, and this appears to be the maximum as well as minimum price asked. Freight rate from the Hanging Rock district is $1.10, and from Birmingham to Ohio River points $3.25. We quote, f.o.b. Cincinnati, for 1902 delivery, as follows:

Southern Coke, No. 1	.... to $27.25
Southern Coke, No. 2	.... to 26.25
Southern Coke, No. 3	.... to 24.50
Southern Coke, No. 4	.... to 22.50
Southern Coke, No. 1 Soft	.... to 27.25
Southern Coke, No. 2 Soft	.... to 26.25
Southern Coke, Gray Forge	$19.75 to 21.25
Southern Coke, Mottled	19.75 to 21.25
Ohio Silvery	30.10 to 31.10
Lake Superior Coke, No. 1	26.10 to 26.60
Lake Superior Coke, No. 2	25.60 to 26.10
Lake Superior Coke, No. 3	25.10 to 25.60

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	$27.25 to $28.25
Lake Superior Car Wheel and Malleable	25.00 to 26.25

Quotations for first six months of 1903, f.o.b. Cincinnati, the buyer to assume freight difference which may exist at time of shipment, are as follows:

Southern Coke, No. 1	$22.75 to $24.00
Southern Coke, No. 2	22.25 to 23.25
Southern Coke, No. 3	21.75 to 22.75
Southern Coke, No. 4	21.25 to 22.75
Southern Coke, Gray Forge	21.25 to 22.25
Southern Coke, Mottled	21.25 to 22.25
Southern Coke, No. 1 Soft	22.75 to 24.00
Southern Coke, No. 2 Soft	22.25 to 23.25
Lake Superior Coke, No. 1	25.10 to 25.60
Lake Superior Coke, No. 2	24.10 to 24.60

In reference to the quotations for 1903 it must be understood that the minimum figures for Southern Irons are ap-

plicable to Virginia brands, and the maximum solely to the Tennessee and Alabama product.

Old Material.—The market is understood to be strong and fairly active on an unchanged basis. We quote dealers' buying prices, f.o.b. Cincinnati, as follows: No. 1 Wrought Railroad Scrap, $21 to $21.50 per net ton; Cast Scrap, $17 to $17.50 per gross ton; Iron Rails, $24.50 to $25, gross; Steel Rails, long, $24 to $24.50, gross; Steel Rails, short, $18.50 to $19, gross; Iron Axles, $27.75 to $28.25, net; Car Wheels, $21 to $21.50, gross.

Cleveland.

CLEVELAND, OHIO, October 14, 1902.

Iron Ore.—The shipment of Iron Ore down the lakes is beginning to be curtailed. The tonnage which has been engaged in the transportation of Ore has been diverted to a great degree into other lines and the shippers have about brought down the lakes all of the Ore that they have sold. The shippers, however, still have a considerable quantity of material to move, amounting perhaps to 3,000,000 tons. Contract vessel tonnage will carry only a moderate percentage of this, and the remainder will have to come down in wild boats. The rates of carriage out of Escanaba have been 60c. for the last few weeks, but the supply of boats falling short of the needs there the vesselmen have started a campaign for higher freights. Shippers have so far refused to pay the advance. The head of the lakes rate has not changed from 75c., nor has the Marquette rate changed from 65c., with about all of the boats that the shippers need ready to enter the trade. The high grade Ores have about all been sold for this year. The lower grade Ores, however, are selling in small quantities, with prospects that the sales will be larger before the year is out. Prices do not change from $4.25 for Bessemer, old range; $3.25 for non-Bessemer, old range, and Bessemer Mesaba, and $2.75 for non-Bessemer Mesaba.

Pig Iron.—Foreign material continues to supply the present needs of the Cleveland Pig Iron market. Up to this time the importation of Iron has been a good deal of an experiment. The first shipments have but recently been received, and the foundries are now working the Iron over. Within a week it will probably be definitely known whether foreign Iron suits the peculiar needs of this section. Pending the decision upon this question many of the consumers who want to import Iron to supply their needs are holding off and their foundries in the meantime are suffering for material which cannot be had at home. While the foreign producers seem to have the call on the local market there is no disposition to take advantage of that situation to force any change whatever in the prices. There is no denying the imperativeness of the need of some consumers for a further supply of material. Many of the foundries are at that juncture where their Iron supply must be increased from some source or the foundries must suspend operations. This is occasioned by the fact that while many of the furnaces have contracts to supply these same buyers with material the constant shortage of Coke has so reduced their productive capacity that it is impossible for them to fill the orders which they have taken. Present requirements of these buyers being filled from abroad is tending to lessen the demand upon the home furnaces for the first half of next year, although by no means is it likely that the home stacks will for a long time to come be in a position where they will need orders. Prices have not changed from $24.50 for No. 2 and $25.50 for No. 1 Scotch Iron, delivered, and $23.50 for No. 1 Nova Scotia Iron, which as stated before on several occasions analyzes between our No. 1 and No. 2. It would be almost an impossibility to quote any price that would at all represent the market on domestic Foundry Iron for this year's delivery. For the first and second quarters of next year the price is $23 at the furnace, with $21 for No. 2 quoted for the third quarter of next year. The Bessemer situation does not improve in the slightest. In fact, it is beginning to look now as if many of the merchant Bessemer furnaces might fall short of material before the first of next July, as the other furnaces are sure to do. This threatens the supply of Bessemer Iron. Jobbers are able to find a small quantity now and then for delivery during the remainder of this year, and they are able to obtain $23 for all that they could procure and a higher price is not impossible. For the first half of next year $21.50 at the furnace would probably represent the market. Basic producers have fallen so short of material that they have withdrawn from the market altogether until the situation improves. The shortage of Coke continues and the supply is intermittent, curtailing the production constantly and threatening a further suspension of work.

Finished Iron and Steel.—This week the larger mills have been compelled to announce to their customers that they have no more Steel Plate for sale for the first half of next year. The announcement was made necessary by the fact that many consumers having large contracts were inclined to increase them from 25 to 30 per cent. The more importunate buyers have gone among the smaller mills which are demanding premiums and have purchased their supply, paying the premium willingly. In one instance a purchaser asked for a large order, to be delivered during June and July of next year, at 2c. at the mill. The mill refused to accept the order, saying it preferred to depend upon the price obtained in the open market at the time the Steel was delivered. In Sheets the reduction of the price has brought out a good business and the market is getting stronger. Orders have been easy during the last week and a considerable tonnage has been booked. Deliveries are still prompt and conditions are advantageous to the buyers. Quotations are as follows: Out of stock No. 27, as a base, 3.10c. to 3.25c., and at the mill, in carload lots, 2.75c. to 2.85c. for the same gauge, one pass cold rolled, full cold rolled being quoted at 10c. extra. The price of Galvanized Sheets has been correspondingly reduced, and No. 27 is now quoted at 4.25c. This week another order of 3000 tons of Ship Steel was taken by the larger mills through their Cleveland agencies. The occasion was an order by J. C. Gilchrist for two more ships of the American Shipbuilding Company. Two ships ordered by the same party of the Columbia Iron Company of St. Clair, Mich., have not been covered as yet. The Plates for this order were taken by the Illinois Steel Company and the Cambria Steel Company, while the Carnegie Steel Company took the Shapes. In Structural Steel there is still a good demand for material, with the prospect of further orders being placed soon, several inquiries having been received. Consumers are depending entirely on either the jobbers or the premium mills for material for this year's delivery, but the larger mills which are holding on to the old association price are still able to take some orders for delivery during the first half of next year. It is apparent, however, that the supply of material for that period is becoming somewhat limited, and only choice orders are taken now. Jobbers have not a full line of sizes for this year's delivery, and any large specification of a general nature naturally goes to the mills which are getting large premiums. Jobbers are quoting 2.50c. to 3c. out of stock for all Shapes, and the smaller mills are able to get 2.60c. without difficulty. The hitch over the duty has brought about a lessening of the imports of Bessemer Steel Billets and a consequent increase in the demand for the home product. The price of the foreign Steel delivered was $28 a ton, while the home mills are now getting $30, Pittsburgh, for Bessemer Steel Billets, and have very little Open Hearth for sale. The Bar market does not change, the prices for Steel being 1.60c., Pittsburgh, for Bessemer and 1.70c., Pittsburgh, for Open Hearth. Bar Iron is nominally quoted at 1.80c., Pittsburgh, but it is known that 1.70c., Pittsburgh, has been taken.

Old Material.—The market has been steady during the week, with a good demand for Cast Scrap, with Mill Scrap also selling well. Prices remain as follows: No. 1 Wrought, $21, net; Iron Rails, $27.50, gross; Iron Axles, $28, net; Cast Borings, $12, gross; Wrought Turnings, $16.50, gross; Cast Scrap, $17.50, net; Car Wheels, $19, gross; Heavy Melting Steel, $19, gross; Old Steel Rails, $20, gross.

Birmingham.

BIRMINGHAM, ALA., October 13, 1902.

The air is full of rumors and the minds of operators are full of gloomy forebodings. Affairs are in a condition that borders on demoralization, and it looks as if those who were engineering the movement had determined that the time was ripe for the contention between labor and capital to be decided. The State official ordered an assessment of $1 per month as a contribution to the anthracite miners, and required the various companies which were notified of their action to deduct that amount from their pay-roll and turn it over to the State Treasurer. This was done wherever there was consent on the part of the miners. But when objection was met from any source the operators contended that they had no authority and consequently no right to enforce any collection other than was authorized, and that any attempt to do so would render them liable to prosecutions that would be very annoying. There was another thing to look at. If the various corporations allowed the labor officials to dictate to them in this matter it would simply place them in the position of being agents for the union and working to secure their aims and submitting to their dictation. This could not be tolerated and a rupture was the result. There was a difference that could only be settled by arbitrary action. So the union, acting through officials, declares a strike is on. Now there is no complaint on any point on the part of the miner—the man who does the work—except from a sentimental point of view. "My wages are satisfactory, as there is profit in them, and they bring me a comfortable support, and I am desirous of letting each section conspire to its own benefit." But things begin to look better. The various companies have been and are holding conferences with the miners' officials and are gradually coming to a settlement.

The most determined opponent to any concession to the demands on the part of the miners is the Tennessee Company, between which there seems to be irregular differences. The consequence is that their miners have been called out to the number of about 4300. Their operations are for the time being checked and there is nothing for them to do but to prepare to go out of blast. As it is they are greatly crippled in their operations. It is very probable that before this is printed they may have several furnaces shut down. There seems no common ground on which they can meet, and the feeling between them seems to be so pronounced that there is nothing to do but to fight it out. Each side is stubborn and not disposed to give in an inch, and it looks as if the fight on between them is simply one of endurance. In the meantime the other large corporations have had conferences with their miners and have come to some sort of an agreement by which their mines are operated. But the terms of these agreements are withheld in most instances from publication and are not discussed openly by the parties thereto. The whole fight is on the question of the recognition of the miners' union as an organization. It would appear on the face of things as if the organization had gained its point in this district.

In the meantime the Tennessee Company have been trying to keep their furnaces going by utilizing their convict labor; but this is an uphill business and will not meet the necessary requirements. There has been talk of importings of Iron into the district, and some effort has been made in that direction. But nothing definite in that direction has yet resulted. As to the value of Iron, the same old story prevails. Some No. 2 Foundry has sold as high as $25, while some of it went at $24. Some No. 1 Foundry also went at $25. Mill Irons are said to be very scarce. For 1903 delivery the price continues to be irregular, and sales have been made at figures ranging from $21 to $22, depending on the circumstances surrounding each particular trade. It may be well to state that there are contracts out for 1903 delivery that aggregate considerably over 100,000 tons sold at $12 and under, and these sales it will be a difficult matter to deliver as due. The air is yet full of gossip concerning the Schuler furnaces, but beyond the notification that contracts have been let for 300 Coke ovens there is nothing definite to be said. The location of the furnaces is as yet a matter of guesswork.

The past week was notable in the way of fires. The Moore & Handly Hardware Company, occupying a square, was burned, but they did not suffer a total loss. Their estimated loss is placed at $200,000, for which they were amply protected in the way of insurance. About half their buildings were saved, and they are doing business as usual. They desire to express their thanks for the sympathy extended and the offers of assistance that were made. Just as soon as the buildings can be erected they will go up. The old Birmingham Rolling Mill, now the property of the Republic Company, also caught fire and suffered a material loss. The damage will be repaired as soon as possible. In the way of Coal the demand has been heavy. Eastern points have made efforts to buy large quantities for shipments to Boston, Philadelphia, Baltimore, New York City and Washington, but no sales, if made, have been reported. The price offered was satisfactory, but the difficulties in the way of transportation were against successful conclusion of trades. Coke has been in fine demand, with prices that compare favorably with those reported in the Eastern markets. Effort in the way of increased production are unceasing, but the demand keeps pace with it. There has been no relief as yet from the Macedonian cry of more Coke.

There have been some large trades made in mineral and Coal lands in Alabama, which for reasons satisfactory to the principals are yet kept quiet, but your correspondent cannot forbear mention of the one in Grey Ore property near Sylacauga. The tract embraces about 1800 acres, and will prove to be invaluable to East Alabama Iron interests. There has been a quiet movement on foot of late to absorb properties that promised to be of value in the future, but the values paid have been kept quiet, and, in fact, all particulars possible.

Mention was made some time ago of the construction of the North Alabama Railroad. Its construction has been let to a Birmingham firm for $750,000, and it will be commenced as soon as possible. There are other enterprises on foot, and barring a bad financial sky the year will close on several important enterprises but just begun. There is evidently an effort on the part of the United States Iron Company to get into Alabama, and there are many rumors concerning their intentions, but they have no representative here, and facts and rumors percolate to us from other sources. There is some uneasiness among the business community as to the outcome of the difficulties between the Tennessee Company and the miners, but beyond saying that both are on their mettle nothing definite can be said. There is no understanding between the operators, and there appears to be one between the miners. That appears to be about all that can be said of it. If the trouble gets any warmer then others may be drawn into it. That is a possible case. At present there is no co-operation among the operators, and no positions will be taken until personal interests so demand.

Pittsburgh.

(*By Telegraph.*)

PARK BUILDING, October 15, 1902.

Pig Iron.—It is estimated that in the past couple of weeks nearly 100,000 tons of Bessemer Iron have been sold to large Steel interests for delivery in first half of next year at prices ranging from $20.75 to $21, at furnace. There is some hesitation on the part of furnace operators in making contracts for Iron for delivery next year until something definite is known as to what Coke will cost. Leading Coke companies have not as yet defined their policy in this matter. The car and motive power situation is bad, and from present indications will continue so indefinitely. Practically nothing is doing in Foundry Iron, as consumers here are covered.

Steel.—The item of interest in the Steel trade just now is the fact that appraisers have taken the position that prices on the other side warrant a duty of $8.96 a ton, instead of $6.72. The matter is now up for adjustment, but in the meantime all quotations on foreign Steel have been withdrawn until the situation as regards the duty has been cleared up. We quote domestic Billets for delivery this year at $31 and we note several sales at that price. Open Hearth Billets for prompt delivery are $32 to $33 for ordinary Carbons.

Coke.—Nothing official has been given out by the leading Coke interests as to the price of Furnace Coke for next year, but it is probable the price will be at least $1 a ton higher than for this year.

(*By Mail.*)

Reports of a large purchase of Bessemer Pig Iron by the United States Steel Corporation for delivery in second half of 1903 have not been verified by those who are informed on the matter. There is again a great scarcity of cars and motive power, causing a scarcity of Coke, and every day from three or four to eight or ten blast furnaces in the two Valleys are banked waiting for the Coke to accumulate. There seems to be no permanent relief for the car shortage, and the coming winter, when navigation will be closed and cars diverted to the Coal carrying trade, will probably see a very bad condition of affairs. The railroads seem to be doing all in their power to meet the situation, and are placing heavy orders for cars and rolling equipment, but the fact remains that the situation is about as bad as it could be and promises to get worse when cold weather starts. An important feature of the situation just now is that the appraisers at Philadelphia have taken the position that the duty on foreign Steel should be governed by prices ruling on the other side for domestic consumption. These are somewhat higher than prices that have ruled on Steel for export to this country, and, as a result, the duty on several lots of Steel that were on their way to this country from the other side has been increased from $6.72 to $8.96 a ton. The matter is now up for settlement, and if the position taken by the appraisers at Philadelphia is upheld other parties who have bought foreign Steel will also have to pay the higher duty on it. The immediate effect has been to cause a withdrawal of all quotations on foreign Steel until the matter is settled. There have been some further sales of Bessemer Pig Iron for delivery in second half of 1903, at prices ranging from $20.75 to $21, at furnace. For this year delivery Bessemer Iron is held at $22.25 to $22.50, at furnace. Tonnage in Plates and Structural Steel continues abnormally heavy, but there has been no change in prices. In other lines of Finished Iron and Steel a moderate tonnage is being placed.

Muck Bar.—We quote domestic Muck Bar of best makes at $36, Pittsburgh, and note a sale of 600 tons at this price.

Ferromanganese.—We quote German Ferro at $51.25 to $51.50, and English at $52.50, Pittsburgh, in large lots. For small lots higher prices are charged.

Sheets.—The cut of $5 a ton in prices of Black Sheets made by the leading interest has been promptly met by most of the large mills. It is somewhat doubtful whether Sheet mills who have to buy their Bars in the open market and pay $32 or higher for them can sell their Sheets at the lower prices and come out even. A fair amount of tonnage is being placed, somewhat larger than before the reduction in prices was made. For 500-bundle lots and over we quote No. 27 Black Sheets, box annealed, one pass through cold rolls, at 2.65c. and No. 28 at 2.75c. For carload lots No. 27 is held at 2.70c. to 2.75c., and No. 28 at 2.80c. to 2.85c. Jobbers charge the usual advances for small lots. We quote Galvanized Sheets, No. 27 Gauge, at 3.60c., or 75 and 10 per cent. off list, and No. 28 at 3.85c., or about 75 and 10 off list, which is 17c. These prices are for 500-bundle lots and over. Carload lots take about $1 a ton advance, while jobbers charge the usual advances for small lots. All above prices are f.o.b. at mill.

Structural Material.—Some heavy local jobs are being placed. Among these are the Coke and Ore bins for the Union Steel Company, bout 6000 tons; Steel viaduct for

Pittsburgh Railways Company, 600 tons, and new buildings for Standard Tin Plate Company, 500 tons. A scheme is now up before Pittsburgh councils to elevate the Pennsylvania Railroad tracks, removing them from Liberty street to Duquesne way, and if this is done it means a very heavy tonnage in Shapes. The outlook in the Structural trade could not be better, as the mills have an enormous tonnage booked for next year and a great deal of work is in sight, much of which is certain to be placed. Beams and Channels for prompt shipment continue to bring anywhere from 2c. to 3c. a pound, depending on tonnage and deliveries wanted. In fact, some good sized orders for Beams have been placed at 2c. and higher, for delivery within the next two or three months. Official prices, which cover indefinite deliveries only, are as follows: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6 inch, 1.60c.; smaller sizes, 1.55c. to 1.60c.; Zees, 1.60c.; Tees, 1.65c.; Steel Bars, 1.60c., half extras, at mill; Universal and Sheared Plates, 1.60c. to 1.85c.

Spelter.—Prime grades of Western Spelter for prompt delivery are held at 5.33½c., Pittsburgh. Futures are about 5.23½c. Prompt Spelter is very scarce.

Plates.—As anticipated, no change was made in price of Plates at the meeting of the association, held in New York last week. It is said some of the Eastern mills who buy their Blooms in the open market urged an advance to the basis of about 1.80c., but this was opposed by the leading mills, who argue that to advance prices would be a mistake. Tonnage continues very heavy, taxing the capacity of the mills to the utmost, and we note the further placing of large contracts for Plates for Lake boats for delivery next year. The Plate business was never in as satisfactory shape as it is at the present time, and the fact that the leading mills continue to pursue a conservative policy in the matter of prices is no doubt largely responsible for the excellent condition of the trade. Plates for delivery any time this year bring from 1.90c. to 2c. at mill. Official prices governing indefinite deliveries, and which were reaffirmed last week, are as follows: Tank Plate, ¼-inch thick and up to 100 inches in width, 1.60c., at mill, Pittsburgh; Flange and Boiler Steel, 1.70c.; Marine, Ordinary Fire Box, American Boiler Manufacturers' Association specifications, 1.80c.; Still Bottom Steel, 1.90c.; Locomotive Fire Box, not less than 2.10c., and it ranges in price to 3. Plate more than 100 inches wide, 5c. extra per 100 lbs. Plate 3.16 inch in thickness, $2 extra; gauges Nos. 7 and 8, $3 extra; No. 9, $5 extra. These quotations are based on carload lots, with 5c. extra for less than carload lots; terms, net cash in 30 days.

Steel Rails.—The Pittsburgh & Lake Erie has placed about 15,000 tons with the Carnegie Steel Company. Rail mills are sold up to about September 1, 1903, tonnage booked, with what will be carried over from this year, aggregating about 1,700,000 tons. We quote at $28, at mill, for Standard Sections.

Hoops and Bands.—A fair amount of tonnage is being placed, but on good orders concessions in prices are being made. We quote Hoops at 1.90c. for 250-ton lots and over and 2c. in carloads. Bands are 1.90c. for Bessemer stock, 12-gauge and heavier, while for Open Hearth stock $2 per ton advance is charged.

Rods.—The firmer feeling in Steel, due partly to the threatened advance in duty, is reflected in Rods, and we quote Bessemer at $36 and Open Hearth at $37, makers' mill.

Bars.—Several leading mills advise us that demand for both Iron and Steel Bars is somewhat improved, while specifications on old contracts are coming in better than for some time. Some contracts have been placed for delivery in next year, and the outlook is that the mills will have steady work through the winter. We quote Steel Bars at 1.60c., at mill. All specifications for less than 2000 lbs. of a size are subject to the following differential extras: Quantities less than 2000 lbs., but not less than 1000 lbs., 0.10. per lb. extra. Quantities less than 1000 lbs., 0.30c. per lb. extra, the total weight of a size to determine the extra regardless of length. We quote Iron Bars at 1.80c. to 1.85c. in carloads and 1.90c. in small lots, f.o.b. Pittsburgh, half extras as per National card.

Merchant Steel.—Prices on Shafting were reaffirmed at the meeting of the association held in New York last week. A moderate tonnage is being placed, but on some lines, notably Tool Steel, there is some unevenness in prices. We quote: Tire, 2.15c. to 2.25c.; Spring, 2.25c. to 2.35c.; Toe Calk, 2.30c. to 2.40c., base; Sleigh Shoe, 2.15c. to 2.25c. Differentials are as follows: Less than 2000 lbs. of a size and not less than 1000 lbs., 10c. advance; less than 1000 lbs. of a size, 30c. advance; Cold Rolled Shafting is 47 per cent. off in carloads and 42 per cent. in less than carloads delivered in territory east of the Mississippi and north of the Ohio rivers. Tool Steel is 6½c. to 10c. for ordinary grades and 12c. and upward for special grades.

Merchant Pipe.—The report that the active competition in Butt Weld sizes of Pipe was also affecting Boiler Tubes is a mistake. The facts are that mills rolling Boiler Tubes are all more or less behind in deliveries, tonnage being heavy right along, while prices are very firm. All the locomotive shops and other consumers as well have been heavy buyers of Tubes, and this trade is in splendid condition. In the Butt Weld sizes of Merchant Pipe competition among outside mills is very active, and has been for some time. Prices have suffered more or less, some mills giving an extra 10 per cent., while others are quoting even lower. Jobbers are carrying as light stocks as possible, believing that a reduction in official prices is probable. Discounts on carload lots, on which an extra 10 per cent. is allowed and occasionally more, are as follows:

Merchant Pipe.	Black.	Galvd.
⅛ to ¼ inch, inclusive	60	48
⅜ to 12 inch, inclusive	67	55

Skelp.—The market continues very quiet and prices are weak. We quote Grooved Iron Skelp at 2c., and Sheared at 2.10c., at mill. On large orders it is possible these prices might be slightly shaded by some mills who seem very anxious for business.

Old Material.—The Scrap market is fairly active and prices are firm. The scarcity of Pig Iron is causing a heavy demand for Melting Scrap, and for which good figures are being paid. We quote Cast Iron Borings at $12, gross tons, Pittsburgh or Valley shipment. Old Car Wheels are firm at $23; Heavy Melting Stock, $22; No. 1 Busheling Scrap, $18, in net tons, and No. 1 Wrought Scrap, $21.50 to $22, in net tons.

Coke.—The Coke market continues to break all records in the matter of prices, and we are advised that Furnace Coke for prompt shipment has sold as high as $11 to $11.50 a ton, at oven. There is general distress all around among consumers for want of Coke, owing to scarcity of cars and motive power, and the situation does not promise to show early improvement. The upper and lower Connellsville region made last week about 305,000 tons of Coke, and large stocks are piled up in the yard at every Coke plant in the region, awaiting cars for shipment. It is said that both regions could ship 15,000 cars of Coke a week, if the railroads could furnish the cars and motive power, while the actual shipments last week were less than 11,000 cars. The price of Furnace Coke on contracts for next year's delivery is a matter of much interest in the trade just now. Some contracts have already been made at prices as high as $4 a ton, but several of the leading Coke interests have not yet announced their policy as to prices of Coke on contracts for next year's delivery.

The offices and warehouses of Follansbee Brothers Company, manufacturers of and dealers in Tin Plate and Metals, have been removed from Second avenue to their large new building at Third and Liberty avenues, Pittsburgh.

The main offices of the McClintic-Marshall Construction Company, builders of bridges, Iron and Steel structures, have been removed from Park Building, Pitsburgh, to the new works at Rankin, Pa.

The Penn Shovel Company of Pennsylvania have brought suit in the United States Circuit Court at Indianapolis against the Chicago Steel Mfg. Company for $7874.25 damages for breach of contract. The complaint alleges that defendants agreed to deliver to the plaintiffs 500 tons of steel between January 10 and July 1, 1902, and that only 20 tons were delivered. Of the remainder 385 tons were to be 16 gauge and 95 tons 14 and 15 gauge steel, the former at $2.05 per 100 pounds, the latter at $2 per 100 pounds. Plaintiffs further allege that they were compelled to purchase elsewhere the deficient amount of steel, 480 tons at $2.84, or $7874.25 more than their contract price with the defendants, the market having advanced.

In the tower elevator of the Philadelphia City Hall a severe test of the safety air cushion, manufactured by the Ellithorpe Safety Air Cushion Company of New York, was recently given. The elevator was allowed to drop 400 feet, and within a distance of 84 feet from the ground the speed was gradually reduced until the car came to a complete stop without perceptible jar. Inside on the bare floor were placed eggs and glass bulbs, but only a few of the former were cracked in what is claimed to be the greatest elevator drop ever made.

The St. Clair Terminal Railroad, an identified interest of the Clairton Steel Company, have placed orders for about 200 steel cars. These will be used for delivering billets to plants located in the Monongahela Valley and over tracks owned by the St. Clair Terminal Railroad.

The New York Machinery Market.

NEW YORK, October 15, 1902.

Another excellent list of machine tools soon to be purchased has just been issued. It is estimated that the value of the tools included will foot up to about $250,000. It was sent out a few days ago by the International Steam Pump Company, and the equipment, we are informed, is intended for the Snow shops at Buffalo, N. Y. At this point the main machine shop is to be doubled in size and a new erecting shop and tool room are to be built. A new foundry, 450 feet long, is also under way. The machine tools to be purchased at this time are intended mainly for the new machine shop. For most of the other apparatus which will be needed specifications have not as yet been issued. The machine tool list includes principally heavy types. Planers occupy a conspicuous position. One planer alone it is estimated will cost upward of $25,000. This machine is to be 144 x 144 inch, with 25-foot travel. Among the other planers specified are one 120 x 120 inch by 25 foot, one 84 x 84 inch by 20 foot, one 48 x 48 inch by 12 foot, one 72 x 72 inch by 16 foot, one 60 x 60 inch by 14 foot, one 44 x 44 inch by 10 foot and one 36 x 36 inch by 10 foot. The last four named machines are to be spiral geared. There are eight large boring mills required as follows: One 168 x 168 inch, one 144 x 144 inch, two 120 x 120 inch, one 84 x 84 inch, one 72 x 72 inch, one 60 x 120 inch and one 60 x 60 inch. Of drills there are to be 15 radials and two uprights. The radials will consist of one 10-foot, eight 5-foot, two 43-inch and four 20-inch. The upright drill presses are to be 25-inch machines. A large six-spindle multiple drill is also specified. Three large slotting machines are required as follows: One 72 inch by 18 foot, one 60 inch by 15 foot, one 48 inch by 12 foot. Twelve good sized lathes are on the list. They include one 72 inch by 24 foot, one 56 inch by 15 foot, one 44 inch by 12 foot, one 36 inch by 24 foot, one 36 inch by 12 foot, one 30 inch by 8 foot, triple geared, and two 24 inch by 12 foot and four 20 inch by 10 foot engine lathes. Two plain milling machines, one 24 inch and one 18 inch shapers, one rotary planer, with 38-foot bed and 60-inch cutting head; eight wet tool grinders and four emery wheel stands complete the list. A. F. Colling, the purchasing agent of the company whose offices are at 114 Liberty street, New York, is in charge of the work. We are advised on good authority that the subject of purchases for the company's new Harrison (N. J.) works will not be taken up for some months.

Inquiry throughout the whole machine tool trade has kept up in brisk style during the week, and merchants in town are again complaining bitterly of the long deliveries, especially on heavy tools. Many assert that the demand for tools in lots of from one to six has never been better. Prices are firm and unchanged.

W. M. Quirk, general manager for J. Barre Johnston & Co., Freemantle, Australia, is now in this country making arrangements with American machinery and equipment manufacturers for the handling of their goods in Western Australia. He has just returned to New York from a Western trip where he has been negotiating with several machinery concerns. He is making his headquarters while in this country at the offices of the Lunkenheimer Company, 26 Cortlandt street. While here he is also looking into the subject of American railway equipment, and when he returns to Australia he will place a number of orders in connection with electric railway work. He has influential connection with the Australian West Coast Government railways. J. Barre Johnston & Co. also have offices and warerooms at Perth, Calgoorlie, Sydney and Melbourne, Australia. They are agents in Western Australia for the International Steam Pump Company, the General Electric Company, the Babcock & Wilcox Company, the Lunkenheimer Company and the H. W. Johns-Manville Company.

An addition is about to be built to the Garwood (N. J.) plant of the Hall Signal Company, whose principal offices are located at 25 Broad street, New York. Inquiry preparatory to the purchase of the equipment is now out. As the extensions are to be used for the manufacture of automatic railway signals a considerable amount of new machinery will be required. We are informed that the new building is to be 60 x 100 feet and three stories high. This will make the full length of the main building 250 feet. A. J. Wilson, assistant general manager of the company, is conducting the purchasing.

The White Mountain Paper Company of Portsmouth, N. H., have placed orders for fuel economizers and electrical apparatus. The contract for the former went to the Green Fuel Economizer Company of Matteawan, N. Y., and the electrical contracts were awarded to the Westinghouse Company.

The Barber Asphalt Company of 11 Broadway, New York, are receiving bids for mechanical equipment for a large new plant, which they are to build at Perth Amboy, N. J. T. C. Brennan and L. S. Kasson will be in charge of the work. The office of Mr. Brennan, who is superintendent of machinery for the company, is located at 11 Broadway, while Mr. Kasson is located at the company's offices foot of Sixth street, Long Island City, N. Y.

Bartlett & Hayward of 100 Broadway are purchasing equipment for a large new plant to be built by the Brooklyn Union Gas Company. H. G. Cooke, New York representative of the Connersville Blower Company of Connersville, Ind., received a contract for two gas exhausters and engines, each to have a capacity of about 12,000,000 cubic feet per day.

The shops and round houses of the Kanawha & Michigan Railroad Company, at Middleport, Ohio, and of the Baltimore & Ohio Railroad Company, at Connellsville, Pa., are to be heated by the fan system designed and installed by the American Blower Company of Detroit, Mich. The same company are furnishing mechanical draft apparatus for the boiler plant of the New York, Ontario & Western at Norwich, N. Y. The company are at present executing an order for ten large steel plate fans and about 17,000 feet of heating surface for the University of Chicago. The American Laundry Machinery Company's plant at Norwood, Cincinnati, is also to be heated by a fan system designed and installed by the American Blower Company.

Edgar L. Street, consulting engineer of the Santa Fé Water & Light Company of 44 Wall street, New York, is preparing specifications for a large water power equipment. The plant is to take power from the Nambe River, and supply the city of Santa Fé, N. M., and surrounding towns with electric light and power.

Specifications have been issued and bids will be received until October 17 by the village of Castile, Wyoming County, N. Y., for a complete electirc light plant.

Ramon Valdes of 44 Broad street, New York, is receiving bids for the equipment of a 1600 horse-power hydraulic plant, to be installed in Porto Rico by the Rio Plata Electric Company. This company will also take over the Luz Electrica, an electric lighting station at San Juan of about 800 horse-power. The work will include the installation of several pipe lines ranging from 4½ to 5½ feet in diameter.

Boston Machinery Market.

BOSTON, MASS., October 11, 1902.

The Boston dealers in machinery report business rather quiet, but not at all unseasonable. The manufacturers have profited by the recent late summer slackening of demand, and they are gradually catching up with their orders. Some dealers state that business is lively with them, and so far as seen there are none of them who are at all inclined to pessimism, notwithstanding the uncertainty regarding the outcome of the coal trouble and its effect upon other industries. In a few instances there are slight complaints of slow collections, but this condition apparently has not reached a serious stage. There is a great call for gas engines, which is largely due to the scarcity of coal, and there is a heavy demand for second-hand machinery, particularly in the wood working line, where the supply is not sufficient to meet the calls.

The machine tool dealers report that the fall trade started very satisfactorily, and that the outlook is very encouraging. Deliveries of heavy machine tools continue slow, it requiring from two to six months to fill orders. Inquiries are not confined to special lines, but rather cover the whole range of stock. In short, the comment of one dealer: "We keep moving," seems to express the general state of affairs in the machinery and machine tools trade in this locality.

The Contoocook (N. H.) Needle Company have just started their plant, having obtained the equipment of machinery and tools in Boston.

The Fore River Ship & Engine Company have signed a contract to build a steel six-masted schooner for a syndicate headed by John G. Crowley of Boston. The schoner will be 339 feet long and of 7700 tons displacement.

The Maine Secretary of State has received the certificate of organization of the Standard Mfg. Company organized at Bath, Maine, to deal in iron and steel. The authorized capital is $300,000. Edgar F. Buck of Brockton, Mass., is president, and James L. Wade of North Easton, Mass., is treasurer.

Eugene N. Foss of the B. F. Sturtevant Company has been unanimously nominated for Congress by the Republicans of the new eleventh Massachusetts District. This district being nominally Republican Mr. Foss will undoubtedly be elected, in which event he would have the honor of being its first representative to Congress.

The city of Boston has awarded the contract for the construction of the steel superstructure of Sections A and B of Broadway Bridge. The successful bidder was the Boston Bridge Works, the price being $112,874. The other bidders and their bids were: New England Structural Company of Boston, $113,900; the Eastern Bridge & Structural Company of Boston, $116,450; the Variety Iron Works Company of Cleveland, Ohio, $119,000; the King Bridge Company of New York, $119,500; W. H. Keegsers & Son of Portsmouth, N. H., $121,950; the American Bridge Company of Boston, $123,300; the Berlin Construction Company of Berlin, Conn., $128,000; the Canton Bridge Company of Albany, N. Y., $130,000.

Metal Market.

NEW YORK, October 15, 1902.

Pig Tin.—The market opened quietly, and showed a declining tendency until Monday, when 25.10c. was reached, 100 tons being sold for London account. The London market, however, reacted sharply, then, on the report of the settlement of the Coal strike here, spot rose to 25⅞c. from which it has reacted to 25.50c. to 25.85c. at the close. Futures are easy at 25.35c. to 25.50c. for October and 25c. to 25.25c. for November. London declined to the lowest point on Friday to £113 10s., then recovered to £117, and closed at £116 10s. for spot and £115 12s. 6d. for futures.

Copper.—The general halting of business, incident to the fuel troubles, is affecting the Copper market. Some of the manufacturers of the Naugatuck Valley are asking for the postponement of shipments, and leading buyers will not commit themselves to purchases for early winter requirements until the Anthracite Coal situation and the financial affairs are settled. Standard Lake Copper has sold at 11.75c., while those brands which are less readily marketable are being offered at a shade less. Electrolytic Copper is quoted at 11.50c. to 11.60c. Production continues on a liberal scale, but accidents are keeping it from reaching full capacity. London closes at £52 for spot and £53 3s. 9d. for futures, with Best Selected at £56.

Lead.—We are officially advised that the merger of the manufacturing interests, including the leading makers of Sheet and Shot, is practically closed. The papers have not yet been actually signed, and the financial interests back of the enlarged National Lead Company are not likely to bring out the new proposals until the money market is in better shape. With the desilverizing interests practically controlled by the American Smelting & Refining Company, and the great majority of the manufacturing end under one management, the market for the metal becomes pretty much restricted, particularly since the smelting interests will also be largely interested in the manufacturing end. Of transient interest at the present time is the fact that the National and Desloge plants in Southeast Missouri have been closed down for lack of Coke. The official quotation continues to be 4.12½c. for spot and 4.10c. for futures, New York.

Spelter.—The market is quite strong, with reports of sales of some magnitude in the Central West. St. Louis is quoting 5.20c. to 5.25c., while New York spot is 5.50c. to 5.55c.

Antimony—Is unchanged. Halletts is quoted 7¾c., Cookson's 9½c., and other brands 7¼c. to 7½c.

Nickel.—No change is noted. Large quantities down to ton lots are now quoted at 40c. to 47c. per lb., according to size and terms of order. Smaller lots are quoted as high as 60c., according to quantity.

Quicksilver.—The market is quiet and unchanged, the ruling quotations being $48 per flask of 76½ lbs., each in lots of 50 flasks or more. London is unchanged at £8 15s.

Tin Plate.—The Tin Plate trade is acknowledged to be in a serious condition, and large stocks have accumulated. The outside mills are actively seeking business. The trade is under the impression that if the drawback Plate business is not secured by the assent of the workers to the proposition of the American Tin Plate Company then a sharp revision in prices will become imperative. Official prices are unchanged.

New York

NEW YORK, October 15, 1902.

Pig Iron.—One of the leading consumers in this district has once more been on the market for a considerable lot, but has again withdrawn. From the Lehigh Valley comes the report that small quantities of Anthracite are now being delivered to the furnaces. Buying is on a restricted scale, and is almost entirely confined to foreign Iron to piece out delays in the deliveries of Iron due on contracts with home furnaces. Foreign Iron for prompt delivery is selling at $22 to $25, according to brand, while for forward delivery the prices range from $20 to $24. Usually founders take the best grades in small quantities because it helps them to work up Scrap and off grades from other sources. It is probable that the trouble between the Tennessee Company and their miners will be settled at once. For delivery in 1903 the following quotations are made: Northern Iron, at tidewater, No. 1 X, $23.25 to $24.75; No. 2 X, $22 to $22.75; No. 2 Plain, $21 to $21.75. Tennessee and Alabama brands, in New York and vicinity: No. 1 Foundry, $23.25 to $23.50; No. 2 Foundry, $22.25 to $22.50; No. 3 Foundry, $21.50 to $22.

Steel Rails.—Some very good inquiries have been received during the past week, aggregating about 150,000 tons. This includes one lot of 50,000 tons for a Southwestern railroad and one lot of 20,000 tons from a New England road. We are advised that Arthur Koppel, who represents German mills, has received an order for 15,000 tons from the Southern Pacific Railroad for prompt delivery. It is understood that the whole of the Canadian Pacific order has not yet been placed.

Cast Pipe.—Conditions continue as previously reported. Eastern foundries are in receipt of numerous orders for small lots, but are harassed by difficulty in securing supplies of Pig Iron and fuel. Quotations are continued at $36 for 6 inch and $35.50 for 8 to 12 inch, gross ton, at tidewater.

Manufactured Iron and Steel.—Structural Shapes are in somewhat better supply, the Eastern mills making better progress in catching up with their orders. Deliveries from some mills, whose policy has been to refrain from loading up with contracts for long delivery, can now be made in three or four weeks. This has not caused lower prices to be made, as orders are being received for quick shipment in very satisfactory volume and the outlook for winter work is excellent. New building projects, some of them of an ambitious character, continue to come up for consideration in this vicinity. The Plate mills are very comfortably supplied with work and a great deal of new tonnage is pending. The local shipyards are good customers of the mills, and some fairly large quantities are expected to be in the market this week from that source. Prices are firmly maintained. We quote, at tidewater, as follows, but for small lots and prompt delivery much higher prices are being obtained for Structural Material and for Plates: Beams, Channels and Zees, 2c. to 2.25c.; Angles, 2c. to 2.25c.; Tees, 2c. to 2.25c.; Bulb Angles and Deck Beams, 2.10c. to 2.25c. Sheared Steel Plates are 2.10c. for Tank, 2.20c. for Flange, 2.35c. to 2.40c. for Fire Box. Refined Bars are 1.95c. to 2c.; Soft Steel Bars, 1.95c. to 2.10c. Foreign Beams are 1.80c. and Angles 1.90c., ex-ship, New York, in 500-ton lots or greater.

Old Material.—So far as prices are concerned the market shows very little change. The strike situation at Eastern mills is clearing, and some inquiries are beginning to come in from them. Meanwhile the demand from Western mills is so heavy as to prevent accumulations. Dealers expect higher prices when Eastern mills actually begin to take in stock. Cast Scrap is in quite heavy demand. Selling quotations are as follows, per gross ton, f.o.b. cars in this vicinity:

Old Iron Rails	$22.50 to $24.00
Old Steel Rails, long lengths	22.00 to 23.00
Old Steel Rails, short pieces	19.00 to 19.50
Relaying Rails, heavy sections	29.00 to 30.00
Relaying Rails, lighter sections	34.00 to 35.00
Old Car Wheels	20.50 to 21.50
Old Iron Car Axles	27.00 to 28.00
Old Steel Car Axles	26.00 to 27.00
Heavy Melting Steel Scrap	19.00 to 19.50
No. 1 Railroad Wrought Scrap Iron	22.00 to 23.00
Track Scrap	20.00 to 21.00
Busheling Scrap	15.00 to 16.00
No. 1 Machinery Cast Scrap	19.00 to 20.00
Stove Plate	13.00 to 14.00
Wrought Turnings, delivered at mill	16.50 to 17.50
Cast Borings, delivered at mill	10.00 to 10.50

Seaboard Steel Casting Company, Chester, Pa.

At the meeting of the directors of the Seaboard Steel Casting Company, held on Monday, October 13, it was decided to make enlargements and improvements to the foundry plant which will involve the expenditure of a large sum of money and increase the capacity of the plant about one-third. Among the changes to be made will be the erection of a steel building, connected with the main foundry, for the purpose of storing flasks. This building will be equipped with a traveling crane. This will give about one-third more room on the molding floor.

Continuing up the foundry, a large new drying oven will be constructed and an additional furnace put in, making three of the latter, each of 25 tons melting capacity, which will enable the running of two furnaces at all times, with one in reserve for repairs. The finishing department will be increased by the addition of about 50 feet to the machine shop and the installation of additional tools for cutting off the heads and finishing up the castings before shipment.

The annealing pit, now in the chipping shop, will be removed to a corner of the present machine shop so that the space that it now occupies may be given over to the chippers. Another traveling crane will be erected in the machine shop.

The members of the Board of Directors, who sanctioned the above improvements, are Joseph Wharton, Isaac H. Clothier, J. Henry Cochran, Thomas H. Savery, John B. Roach, Morris L. Clothier and President William C. Sproul.

The Machine Tool Builders' at Cleveland.

(*By Telegraph.*)

CLEVELAND, OHIO, October 15, 1902.—Members of the National Machine Tool Builders' Association concluded a two-days' convention here to-day. It was the first regular meeting of the association since its organization at Niagara Falls last August, and the largest gathering of machine tool builders ever held in this country. No further action in the changing of prices was taken, but the members were unanimous in resolving to continue the prices established as a result of the advances decided upon at the Niagara Falls meeting. Important action was taken as regarded terms of sales and in reference to consignments to dealers.

That the machine tool trade at large has been greatly benefited by the recent advances and that everything possible should be done to continue and further the cordial relationships now existing between the members was the sense of the meeting.

The action at Niagara Falls contemplated only the advancing of prices in standard sizes of tools themselves.

At to-day's session this was carried out more fully in an understanding brought about among the various manufacturers regarding standard attachments, &c.

Fixed or uniform values it was decided should be maintained for such attachments as chucks, compound rests and steady rests for lathes. Prices for the lengthening of beds of lathes, it was said, should also be fixed. The subject of electrical drives for machine tools was also discussed and with a view of obtaining a degree of uniformity in price. It was finally decided to refer the matter of attachments to a committee of five, who are appointed by the Executive Committee and who will submit their decisions to the secretary, who is to advise the members by mail. The principal object which it is sought to attain in this connection is to overcome present conditions where the several manufacturers each quote different prices on identical attachments. Thus one of the chief accomplishments at this convention has been the arranging of details whereby better prices will be maintained, not only on standard sizes of lathes, shapers, drill presses and planers built by members of the association, but also on all the extras which enter into trade in these lines, thus making the standard for more uniform and better prices absolutely firm.

It was decided that the association go on record as recommending to the members that they fix their terms with all customers on the basis of 30 days net. It was also unanimously decided that hereafter no consignment shipments whatever be made to dealers by the members of the association.

Another important result of the present meeting has been the furtherance of the good feeling entertained for one another by the machine tool builders, who have heretofore been unable to come together for their mutual advantage. The members of the association now know and understand each other better than ever before.

At yesterday's session F. A. Halsey read a paper showing the confusion and expense to which American machinery builders would be put should the bill be passed which is now pending before the House of Representatives at Washington which calls for the adoption of the metric system in this country. Mr. Halsey said that the condition of affairs at Washington as regards this subject was disputed. He said that unless something is done quickly the bill will doubtless pass at the next session of Congress. He stated that, though Germany has been trying for 28 years to adopt the metric system, its use is not yet universal in that country. In view of this, he said it is preposterous to think that it will be possible to effect the change in this country within three or five years, as the advocates of it claim. He also showed the inconvenience of adopting metric equivalents in this country. The paper was enthusiastically received.

In the discussion which followed William Lodge of the Lodge & Shipley Machine Tool Company stated that while the adoption of the present bill would not make the adoption of the metric system compulsory in the country, excepting in connection with Government contracts, there would be many concerns who would voluntarily make the changes and consequently others would have to do the same in order to hold their position in competition.

Fred. Geier of the Cincinnati Milling Machine Company read a detailed report showing the expense which the change would necessitate at his works. The figures were surprisingly large and showed the disadvantage of the change in a light in which many of the members had not previously considered it.

As a result it was decided that the association go on record as opposing the change, and the following resolutions were adopted:

"*Whereas*, The members of the National Machine Tool Builders' Association in convention assembled, having carefully considered the provisions of House bill H. R. 2054, do hereby emphatically protest against the enactment of said bill, because:

"*First.*—The experience of Germany, in which the old measures are still in large use, has shown that the change cannot be completed even after a generation of confusion.

"*Second.*—The sale of many million dollars' worth of machine tools has been made abroad by members of this association, especially to France and Germany, without requirement or request by the purchasers for changes in general construction to conform to metric measurements, the only changes being in adjusting and measuring screws, the great majority of machines needing no changes whatever.

"*Third.*—The adoption of the metric system would entail an enormous first cost of new equipment to conform to the new standards, and a constant increased cost in the maintenance of a double standard for repairs and renewals, and a consequent increased cost of the product to the consumer."

The following officers were elected for the ensuing year:

President, Joseph Flather, Flather & Co., Incorporated, Nashua, N. H.

First Vice-President, William Lodge, Lodge & Shipley Machine Tool Company, Cincinnati, Ohio.

Second Vice-President, W. P. Davis, Davis Machine Company, Rochester, N. Y.

Treasurer, Enoch Earle, P. Blaisdell & Co., Worcester, Mass.

Secretary, P. E. Montanus, Springfield Machine Tool Company, Springfield, Ohio.

The following members were present:

Joseph Flather, Flather & Co., Incorporated, Nashua, N. H.
William Lodge, Lodge & Shipley Machine Tool Company, Cincinnati, Ohio.
Enoch Earl, P. Blaisdell & Co., Worcester, Mass.
P. E. Montanus, Springfield Machine Tool Company, Springfield, Ohio.
Fred. Geier, Cincinnati Milling Machine Company, Cincinnati, Ohio.
Fred. Holtz, Cincinnati Milling Machine Company, Cincinnati, Ohio.
C. E. Thwing, Draper Machine Tool Company, Worcester, Mass.
R. K. LeBlond, Le Blond Machine Tool Company, Cincinnati, Ohio.
J. B. Doan, American Tool Works Company, Cincinnati, Ohio.
H. C. Hoefinghoff, Bickford Drill & Tool Company, Cincinnati, Ohio.
B. B. Quillen, Cincinnati Planer Company, Cincinnati, Ohio.
G. F. Stewart, Bradford Machine Tool Company, Cincinnati, Ohio.
A. W. Whitcomb, Whitcomb Mfg. Company, Worcester, Mass.
P. G. March, Cincinnati Shaper Company, Cincinnati, Ohio.
A. B. Pattison, Aurora Tool Works, Aurora, Ind.
C. F. Hilker, Hamilton Machine Tool Company, Hamilton, Ohio.
C. H. Alvord, Hendey Machine Company, Torrington, Conn.
Fred. L. Eberhardt, Gould & Eberhardt, Newark, N. J.
S. C. Schauer, Cincinnati Machine Tool Company, Cincinnati, Ohio.
Philip Fosdick, Fosdick Machine Tool Company, Cincinnati, Ohio.
W. P. Davis, Davis Machine Company, Rochester, N. Y.
W. A. Greaves, Greaves, Klusman & Co., Cincinnati, Ohio.
C. F. Mayer, Rahn, Mayer & Carpenter Company, Cincinnati, Ohio.
W. H. Carpenter, Rahn, Mayer & Carpenter Company, Cincinnati, Ohio.
B. F. Barnes, B. F. Barnes Company, Rockford, Ill.
Murray Shipley, Lodge & Shipley Machine Tool Company, Cincinnati, Ohio.
D. D. Ballard, Jones & Lamson, Springfield, Vt.
Albert C. May, Reliance Machine Tool Company, Cleveland, Ohio.
J. C. Oliver, Bardons & Oliver, Cleveland, Ohio.
E. W. Whitmore of Prentice Bros. Company, Worcester, Mass.

Trade Publications.

Engine Lathes.—The Bradford Machine Tool Company, Cincinnati, Ohio, have just prepared a neat leaflet illustrating and describing their 21-inch engine lathe with automatic revolving power feed turret on ways. This machine is also made in a number of other sizes.

Sir William Siemens.—The seventh of a series of leaflets issued by Wyman & Gordon, makers of drop forgings, Worcester, Mass., giving well written stories of men who have been prominently identified with the world's industrial progress has just been prepared, and it contains a biography of Sir William Siemens. This article was written by Dwight Goddard, and is an able tribute to this authority in electrical and metallurgical engineering.

Pneumatic Hoists.—This subject is treated in a pamphlet just issued by the Chicago Pneumatic Tool Company, Chicago and New York. Descriptions and illustrations are printed of a new line of pneumatic motor hoists brought out by the Chisholm & Moore Mfg. Company of Cleveland, Ohio, who were recently absorbed by the Chicago company.

Electrical and Steam Machinery.—A list of the engines, boilers, generators and motors in stock, has just been issued in the "Fall Bulletin" of the Charles E. Duston Company, 11 Broadway, N. Y. The company announce that they have recently secured a commodious and complete storehouse property at Orangeburgh, N. Y., located on the West Shore and Erie Railroads, about one hour's ride from New York City. This has been put in charge of George Esslinger, an electrical and mechanical engineer of long experience.

Riveting Machines.—Catalogue No. 5 has just been issued by the Chester B. Albree Iron Works, Allegheny, Pa., describing their line of "Pittsburgh" riveting machines. Aside from a series of good illustrations and descriptions of the riveters, useful tables on rivets and riveting compiled from authoritative sources and from extended series of experiments are given.

New Jersey Corporations.—Another revised and enlarged edition of "Dill on New Jersey Corporations" is now in press, and will be issued by Baker, Voorhis & Co., publishers, New York, on November 1. Besides the statute and case law to date, the new edition contains some 250 pages of carefully selected corporation precedents, forms useful in the organization and maintenance of corporations generally, selected from the best and including the latest precedents, both American and English. The object and capital clauses of the principal industrial corporations are given.

Ball Bearing Chain.—From the chain department of the Monongahela Iron & Steel Company, Pittsburgh, Pa., a pamphlet has been issued describing the Carter ball bearing chain. In the construction of this chain a ball is interposed between the ends of the links, always forcing the chain to pull in a straight line with equal strain on each link, thereby getting full power of the chain. The Monongahela Iron & Steel Company also issue a price-list on Carter bar iron, Carter ball bearing chain and low phosphorus melting bar.

Iron and Steel.—The Bourne-Fuller Company, Cleveland, Ohio, are sending to the trade a series of neat blotters the printed text of which summarizes the sizes of structural shapes, &c., that can be obtained for immediate shipment from the company.

Machine Tools.—List No. 26 has been issued by the Garvin Machine Company of New York, tabulating the new and second-hand machine tools which were in stock at the company's warerooms on October 1. The list shows that a large number of new as well as second-hand tools are now to be had for immediate delivery.

Power Drills.—Sibley & Ware, South Bend, Ind., have issued an illustrated catalogue of the power drills which they manufacture. The 20-inch drill with improvements, with back gears, power feed, automatic stop and quick return, is recommended for all around work. For heavier work, designed especially for manufacturers, the 24, 26 and 28 inch presses are applicable. These machines are made with stationary or with adjustable head.

Boilers.—Catalogue D, just issued by the Uric Boiler & Machine Company, Kansas City, Mo., furnishes illustrations and descriptions of the various types and sizes of boilers for heating and power which this company produce.

Oil Filters.—The Burt Mfg. Company, Akron, Ohio, are sending out a bright 16-page leaflet describing the "Cross Oil Filter." The text is displayed in two colors, and besides half-tone engavings showing the appearance of the filter a sectional view of the apparatus is given, which clearly demonstrates the simplicity of construction of this filter. An interesting feature is a page of "repeat orders," which consists of a list of prominent concerns who have placed duplicate orders for the filters.

Combination Sets.—The combination sets, protractors and calipers, made by the Brown & Sharpe Mfg. Company of Providence, R. I., are described in a pamphlet just issued. The protractors are used with an accurately graduated blade. The revolving turret that carries the blade is fitted to a nicety and carefully graduated, being engine divided to 90 degrees either side of zero, and every precaution is taken to insure the zero being at right angles to the face of the head. It can be set at any angle and rigidly clamped by a thumb nut. The blade, furnished either soft or tempered, is clamped in the same manner as their combination squares. The level, which is so important an adjunct to a tool of this kind, is accurately set and fastened to the side of the turret. Their "narrow" firm joint caliper is new. The legs are much narrower than usual, which allows its being used to measure the diameter of deep holes at the bottom.

Air Compressors, Pumps and Governors.—Three handsome catalogues have been received from the Gardner Governor Company of Quincy, Ill. Their air compressors are driven by belt, electric motor or steam. The duplex air compressor consists practically of two straight line machines placed side by side upon one bed plate and coupled to one crank shaft with one fly wheel for both. Their duplex steam pumps are built in a wide line of sizes and patterns, adapted to almost every service. Their standard class A governor is of the gravity action, and has an automatic safety stop and speeder. It is made in sizes from 1¼ to 16 inches, and is especially adapted to the larger type of stationary engines. The centrifugal force of the balls is opposed by the resistance of a weighted lever, and the speed is varied by the position of this weight on the lever.

Exhaust Heads—Oil Filters.—The Burt Mfg. Company of Akron, Ohio, have prepared attractive pamphlets dealing with their exhaust heads and oil filters. The Burt exhaust head has perpendicular sides instead of the usual cone shape; this increases the inside area and provides more room for the expansion of steam. With plenty of room for expansion there is no back pressure. Their American oil filter and purifier has the highest speed and capacity; this is accomplished by heating the oil before it is filtered and even the heaviest grade flows freely. Any kind of filtering material may be used, or none at all, and the filtering material may be removed without interrupting the oil service. The filter can be easily cleaned and without disturbing the connections.

Pelton Water Wheels.—The Pelton wheel introduced by the Pelton Water Wheel Company of San Francisco is the pioneer of what is generally known as the "impulse" type of water wheel. In simplest form it consists of a cast iron or steel center, to the periphery of which are attached cups or buckets. The high efficiency of this wheel is due largely to the design and construction of these buckets. The wheel is carried usually on a horizontal shaft, supported by journal boxes, but in special cases the shaft may be vertical with step and thrust bearing. The water being led to the wheel by means of a pipe impinges on the buckets through a nozzle, the end of which is fitted with a cylindrical tip of diameter proportioned to the head of water and amount of power to be developed. Different diameters of tips can be screwed into the nozzle, thereby varying the power of the wheel from the maximum, which is limited by the size of bucket, down to a small proportion of the rated capacity; in this way no more water is used than is actually required for the power, and an uniformly high efficiency is maintained at all stages of load. Much information concerning these wheels and many illustrations of their successful application are contained in a handsome catalogue.

Well Machinery.—The latest catalogue by the American Well Works of Aurora, Ill., describes very thoroughly their complete line of machinery for artesian and oil wells. Their gasoline engine driven automatic drop jetting tubular well sinking machine is used for sinking through ordinary soft formations and soft rock to depths of 500 feet. With the addition of a solid drill and bar it penetrates hard rock. It jumps the drill, drives pipe and pumps water down drill rods, washing up cuttings at the same time.

Down Draft Forges.—The down draft forge system originated with the Buffalo Forge Company, Buffalo, N. Y., and has stood the test of years. A catalogue by the company shows their latest forms of down draft stationary and heating forges for industrial works.

Frederick H. Foote has resigned the positions of second vice-president and director of the Illinois Steel Company, and has opened an office at 532 the Rookery, Chicago. He will devote his time to the management of the Spring Valley Iron & Ore Company of Spring Valley, Wis., of which he is sole owner. The blast furnace, ore mines and quarries of this company have been in successful operation for the past year. Mr. Foote was connected with the Illinois Steel Company for many years.

Iron and Industrial Stocks.

Monday has been a bad day for stocks for the past three weeks. Last Monday a very severe break occurred which ran prices of railroad and industrial stocks down to lower levels than at any previous time this fall, although a few industrials stood the shock of high rates for money very well. Among these were United States Steel and Amalgamated Copper. Sloss-Sheffield also was not forced down as low as a week previous. Locomotive Common broke to 26½, being quite conspicuous in the decline. Tennessee Coal & Iron touched 60⅛, Virginia Iron & Coal went to 35, Colorado Fuel to 81½ and Pneumatic Tool to 80. The pressure on the market was relieved on Tuesday, and the entire list sharply recovered. The transactions of the week were quite heavy in Colorado Fuel and Steel common and preferred.

Several million dollars were distributed in Pittsburgh last week in dividends paid by concerns in that city. The most important were: Westinghouse Air Brake Company, $600,000; American Window Glass Company, $195,000; Pittsburgh Plate Glass, $180,000; Bessemer Railroad, $150,000; Philadelphia Company, $435,000; Manufacturers' Light & Heat, $100,000; National Fire Proofing Company, $140,000; Standard Underground Cable Company, $35,000; Westinghouse Electric Company, $70,000; Union Switch & Signal Company, $20,000; Pittsburgh Coal Company, $525,000, and National Gas of West Virginia, $20,000.

The United States Iron & Tin Plate Mfg. Company of Pittsburgh, will on December 21 redeem all their outstanding bonds at the office of the Union Trust Company in Pittsburgh.

The annual report of the Westinghouse Air Brake Company of Pittsburgh shows about 26¾ per cent. earned on the stock after unusually heavy charges for depreciation in plant.

Dividends.—The directors of the Pittsburgh Coal Company of Pittsburgh have declared a quarterly dividend of 1¾ per cent. on the preferred stock, payable October 25. A small dividend on the common was expected, but it was not declared.

The American Car Foundry have declared regular quarterly dividends of 1¾ per cent. on preferred stock and one-half of 1 per cent. on common stock, payable November 1.

The Phœnix Iron Company have declared a quarterly dividend of $1.75 per share upon the preferred stock, payable October 31. In addition the Board of Directors declared a dividend of $2 per share on the common stock of the company, payable October 31.

The Pennsylvania Steel Company have declared the regular semiannual dividend of 3½ per cent., payable November 1.

The Pittsburgh Malleable Iron Company of Pittsburgh have declared the usual quarterly dividend of 2½ per cent., payable forthwith.

The Tennessee Coal, Iron & Railroad Company have declared the regular quarterly dividend of 2 per cent. on the outstanding preferred stock, payable November 1. It is authoritatively stated that the amount of preferred stock now outstanding is a little less than $250,000.

The Ohio Fuel Supply Company have declared their initial quarterly dividend of 1½ per cent.

The International Steam Pump Company have declared the 1½ per cent. regular quarterly dividend on the preferred stock.

PERSONAL.

George G. Blackwell of Liverpool arrived at Quebec on Saturday last. He expected to go to Sydney first, return to Montreal and proceed to Ottawa, Toronto, Buffalo, Cleveland, Pittsburgh, Philadelphia and New York.

J. G. Lockwood and C. Bowen of the sheet works of Dorman, Long & Co., Limited, Middlesbrough, are visiting this country.

The Liberty National Bank of New York, of which E. C. Converse is president, will increase its capital from $500,000 to $1,000,000 and its surplus from $500,000 to $1,000,000.

Among the directors of the new Windsor Trust Company of New York are Erskine Hewitt, W. B. Leeds, James A. Burden, Jr., and James Gayley.

Charles G. Eckstein of Berlin, Germany, importer of American machinery, especially pneumatic tools, has arrived in this country for a short visit. Communications from manufacturers in the machinery line who wish to confer with Mr. Eckstein on business matters will reach him at his New York office, 249 Centre street.

Charles R. Darrow has resigned as manager of the roll department and secretary of the Wheeling Mold & Foundry Company, Wheeling, W. Va., has sold his stock in the company and is no longer in any way connected with that establishment.

Ernst Wiener, manager of Arthur Koppel, New York, has returned from an extensive business trip in Europe.

Lawrence C. Phipps, formerly treasurer of the Carnegie Steel Company, in Pittsburgh, has closed his home in that city and will spend the winter in Denver, Col., and also in Old and New Mexico. Mr. Phipps bought a winter home in Denver about a year ago and it is his intention to spend the winters there.

Henry C. Frick of Pittsburgh has purchased a summer home at Prides Crossing, Beverly, Mass. Mr. Frick with his family spent the past summer at this place.

David Adams, treasurer of the Sharon Steel Company, at Sharon, Pa., met with a painful street car accident in Sharon on Monday, October 13. Mr. Adams' many friends in the trade will be glad to know that his injuries are not serious.

The Master Steam Boiler Makers' Association.

(*By Telegraph.*)

CHICAGO, ILL., October 14, 1902.—The Master Steam Boiler Makers' Association, founded January 11, 1902, held its first annual convention at the Great Northern Hotel, Chicago, October 9, 10 and 11. The meeting was called to order by President T. C. Best of Chicago, and after prayer by Frank W. Gunsaulus of the Armour Technical Institute the organization of the association was completed behind closed doors. Addresses were made by the president, vice-president, secretary and treasurer. All subsequent meetings were open to the public. A large number of important subjects had been arranged for discussion, but only a small portion of the questions could be disposed of at the meeting. Among those considered was the inspection of boilers, the result of the discussion being the adoption of the following resolution, which was presented by the president:

Boilers are to be inspected by the following method: Manholes and other covers to be removed, and after a thorough examination of the inside and outside, the actual measurements are to be taken of all braces, stays, seams, &c., and the working pressure found by calculations formulated by the association; after which the covers are to be replaced and hydraulic pressure applied.

Five was adopted as the factor of safety on cylindrical shells of boilers. After due deliberation the association recommended that all rivet holes be punched 3-32 inch and afterward reamed to the desired size. It was determined that all telltale holes for stay bolts should be drilled on the outside while the flue sheet and four or five upper rows of stay bolt holes should be drilled on the inside of the fire box on the side sheets.

The association decided to adopt 12 threads to the inch as the standard for all stay bolts and stay bolt taps, but although there was much discussion it was found impossible to arrive at a decision in regard to other matters connected with stay bolts and it was determined that attention be especially given to this subject during the following year and taken up at the next convention. Committees were appointed to give consideration to the other important questions and report at the next convention.

Frank W. Gunsaulus of the Armour Technical Institute gave an interesting talk on Saturday afternoon concerning the needs and responsibilities of the association and the good to be accomplished by annual conventions.

The meeting was well attended, there being representatives present from Canada and Mexico as well as throughout the United States. The next annual convention will be held in Chicago, October 8, 9 and 10, 1903. The following officers were elected: President, T. C. Best, Chicago; vice-presidents, Wm. M. Wilson, Chicago; Wm. Ord, Stratford, Ont.; F. H. Ryan, Alamogordo, N. M.; F. A. Mayer, Cheyenne, Wyo.; J. Wolfenden, Milwaukee, Wis.; secretary, Geo. M. Clark, Chicago; treasurer, J. J. Boyce, Chicago.

HARDWARE.

WE give in the following pages a very interesting collection of letters from English merchants in regard to the methods adopted by American manufacturers in cultivating foreign trade. They thus touch upon a subject concerning which much is to be learned in this country, as our manufactures are beginning to take a commanding position in the world's markets. There is obviously danger that those in this country who are seeking export business will endeavor to secure it without adequate knowledge of the trade conditions in the markets to be supplied or of the wisest methods of obtaining a foothold. There is too apt to be a feeling, more or less defined, that measures which have resulted in securing the sale of their products here will be equally successful abroad. Many of them have learned by an expensive experience—for experiences in the foreign markets are often costly—that very different methods must be pursued in the cultivation of trade in these distant fields, and that, indeed, each market is to be considered by itself. The letters given in this issue by our London representative will be of value to careful students of export matters as throwing light on the way in which the subject is regarded by representative English houses, some of whom are already prominently identified with the sale of American Hardware. While there is not entire agreement among them in regard to the various points touched upon, the opinions expressed are entitled to weight and will admirably supplement the experience of our manufacturers and their knowledge acquired in other ways of the elements of the problem, the successful solution of which will be the extension of American trade relations on a great scale in fields which are as yet comparatively untouched. The development of the producing capacity of the country under the existing prosperity is a cogent reason for giving the question as to the securing of foreign fields immediate and most careful attention. The indications point to the fact that at no distant date manufacturers who are now absorbed in the care of domestic business will be desirous of finding a place for their products in markets which in days of prosperity have been too much neglected.

Nearly every enterprising Hardware store makes an effort to secure the trade which belongs especially to the holiday season. They recognize the demand which is characteristic of the holidays by purchasing and making prominent lines of goods which are called for at that time. A well assorted Hardware stock covering a liberal range contains many articles which are adapted for special sale at this season, when sports and household equipment are in order, and when many of those who have not much to spend in the way of luxuries or ornament are ready to make reasonable outlays for the supply of more prosaic and practical needs. There is unquestionably an opportunity to bring together many articles which will present an attractive appearance and make a strong appeal for purchase. The gradual widening of Hardware lines so as to include many fine and showy goods, such as Lamps, Plated Ware, Cutlery, &c., provides enterprising merchants with excellent material to work with in giving their store an attractive and holiday air.

At the present time more rapid progress than ever before is being made in bringing into Hardware stores those lines which a few years ago were considered as belonging in other fields of trade. Many of them are now distinctly accorded a place as Hardware, and are being handled by a greatly increased number of Hardware merchants. Where the circumstances justify it—that is, where local conditions are not decidedly against this tendency, it is desirable that Hardware merchants take up these lines and not only widen the scope of their business, which in itself is a gain, but at the same time add to their assortment goods which yield a much better profit than many articles comprised in the old time Hardware stock. The fact that the country is making marvelous strides in wealth, giving the people generally much more to spend than formerly, and calling for and permitting more liberal expenditures in domestic and commercial life, affords merchants an opportunity advantageously to take up the finer and more æsthetic lines, for the supply of which the community will naturally look to their establishments. With the constant enlargement of the classes of goods which come under his care the Hardware merchant should avail himself of the advantage there is in handling articles which are removed from the plane of necessaries and take their place among the refinements, if not the luxuries, of life. That the store is thus made more attractive and better fills the reasonable expectations of the public is a consideration which should have weight in deciding upon this policy, while of greater weight perhaps is the fact that these lines are those which rightly managed yield a better profit than the commonplace things of the trade. The fact that prosperous times are enjoyed by all classes throughout the country is undoubtedly accelerating the progress of the Hardware trade in the direction indicated, so that the coming holiday season will see more attention than ever before given to this kind of trade.

Many merchants have already made their preparations for their holiday business and placed their orders for such special goods as they may require for the carrying out of their plans in regard to it. To those who have not heretofore given particular attention to this business there still remains time for the making of preparations for such efforts in that direction as they deem advisable. There is, however, little time to be lost in the maturing of plans, especially as in all probability some lines which would naturally be taken up in this way may be hard to obtain if their purchase is long deferred.

Condition of Trade.

There continues to be a steady call for goods upon manufacturers, a large proportion of whom are unable to fill orders promptly. This results from the back orders, from which many of them have not been able entire to free their books; from the steady demand which comes from the trade and from interference with production on account of the difficulty in getting raw material, and latterly fuel. The amount of current business which is coming in to manufacturers is not just at this time especially heavy, as the trade generally have covered their requirements and either have the goods in stock or are awaiting their receipt. The difficulty experienced in obtaining coal is having its effect both on production and, to a slight extent, on prices. Since our last report little has occurred to cause any change in the general tone of the market. The reductions recently made in the prices of some leading goods and the evidences of weakness in a few lines which have been held at high prices have some effect in producing a conservative tone, and buyers are refraining from purchasing in anything of a speculative

spirit, while at the same time they are anticipating with confidence their early needs. Reports from the jobbers and retailers are very gratifying in regard to the volume of current business, and were it not for the liberality with which prices are cut by both the large and smaller trade profits would be much more satisfactory, while even in the present condition of things there is little ground for complaint.

EXPORT TRADE.

Manufactured exports from the United States have decreased in volume and value during the last two years, as a result largely of the abnormal demand for the products of our factories in this country; but the shrinkage is not as great as might have been expected, considering the enormous interstate trade of the United States at higher prices than can be obtained abroad. There is little doubt that this outward stream will resume its flow in increased volume just in proportion to the slackening demand here.

A partial review of the export situation at present shows that our shipments to some of the South American republics, for instance United States of Colombia, and some of the smaller Central American countries, have decreased in the past two years in consequence of the revolutions going on there and the involved financial conditions existing in portions of that territory as a result. The low prices for sugar and coffee in some of the countries have also curtailed their purchasing power.

Trade with River Plate territory—that is, Montevideo, Buenos Aires, Rosario, &c.—seems to be on a par with that of a year or so ago, so far as Hardware is concerned, but the metal business, for the present at least, has been lost to us through the lower prices which have prevailed in Europe. An exception to this rule is in Galvanized Iron Tubes and Barb Wire, the manufacturers of which have been credited by New York exporters with standing loyally by them and putting them in a position to keep the business in these lines here.

To Europe trade conditions for 1902 will not compare favorably with some recent years in selected lines of Hardware, although possibly the actual dollars and cents comparison of the amount of Hardware exported will not be so unfavorable as a comparison of quantities sold of given articles. The dull trade in Germany and the fact that prices there have been lower than here, added to the fact that so many lines of our goods have been imitated there, has naturally cut off much business. While new articles have been introduced by our exporters it cannot be said the past 12 months has been a period of satisfactory improvement. The prohibitive duties levied on American goods of the character of Hardware and metal products by the Russian Government have practically made competition in some lines with German and English factories out of the question.

In the Oriental trade—Asia, Japan, &c.—the business in manufactured articles, such as Machinery and Tools of all kinds, has improved over previous years, despite such drawbacks as cholera in the Philippines and the decline in the price of silver in China, which has retarded trade and occasioned a somewhat hand to mouth business. Increased quantities and varieties of products are going into the markets of India, and in spite of the unsettled and impoverished condition of South Africa a larger volume of business is reported.

The enormous capacity which is being developed in our manufacturing establishments is unquestionably in preparation for an early and aggressive movement in the direction of a greatly increased export trade.

Chicago.

(By Telegraph.)

The difficulty of obtaining goods on specified time and in quantities ordered is one of the harassing features in the Hardware trade at the moment. In some lines, such as Hatchets, Hammers, Axes, &c., this is due to the difficulty that the factories have had in securing sufficient fuel to enable them to keep up production to full capacity. Some local agents have received word from their principals that for this reason they have been unable to turn out more than two-thirds of their ordinary capacity. This somewhat hampers local trade, the demand for the goods being unusually active. Much interest is still centered in the Shovel situation and the trade is waiting with some impatience to know the result of the independent manufacturers' meeting at Louisville and that of the associated manufacturers in New York. While the trade is still somewhat disturbed by the report of lower prices being made on goods of second quality—even lower prices being reported to be current on Open Back Shovels—prices of standard goods are said to have been well maintained and some improvement is anticipated to result from the conferences above referred to. The associated manufacturers of Hoes, Rakes, Forks, &c., are reported to have taken liberal contracts for the coming year, orders being already in hand which insure the running of the factories to full capacity, and from now on it seems doubtful if further orders of much magnitude could be accepted. Independent manufacturers of the same line of goods are also securing satisfactory orders for the coming season. Local agents of Saw manufacturers report business still in a very active condition, with the volume of sales again increasing. Contrary to the usual experience, the summer months, especially June and July, were exceedingly active in this line, orders being booked equal to some of the previous active months. These and other conditions prevented manufacturers making prompt deliveries, but the most important manufacturers are now said to be only about 60 days behind in the filling of contracts. Agents of manufacturers turning out Refrigerators and Mowers report satisfactory orders in hand for next year's delivery. It is yet early for large orders of Builders' Hardware for next year's delivery, but some desiable orders have aleady been placed. In jobbing lines there has been a fair distribution of Registers and Strap Hinges, and some sales of importance of Butts, Locks and Padlocks to the country and local trade. The orders for Ammunition have continued quite liberal, some jobbers reporting much difficulty in obtaining ample supplies. The demand for Enameled Ware, Kitchen Utensils and other household goods has continued liberal, jobbers reporting difficulty in obtaining supplies in ample quantities to fill orders promptly. A more satisfactory market is reported for Nails, Wire and Heavy Hardware, with a fair volume of business. The shortage previously noted in certain sizes of Planished Iron and Smooth Steel is still a drawback to trade. The movement in general lines of Hardware and Specialties has improved materially.

St. Louis.

(By Telegraph.)

The requirements of the consumers of Hardware continue to call very heavily on the jobbers at this point and no complaint is heard as to the distribution of the trade, all sharing alike according to the capacity of their establishments. Last year October was a particularly heavy month in trade circles, and it is predicted that if the present pace is continued this year will set a new mark. Some lines of goods continue scarce and it is the cause of considerable annoyance to the manufacturer at this busy season. Especially heavy calls are reported for Axes, Cross Cut Saws and other Woodmen's Supplies. A revision in the price-list for Sad Irons has taken effect and further changes of this character have extended to other items in the jobbers' lists.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—The volume of business during the past two weeks has been very satisfactory to the general Hardware trade of our city, if we leave out of that statement the trade coming from the anthracite coal regions, which, as your readers are all aware, has been depressed for the last five months, and, to make a significant quotation, "the situation has become intolerable." During the continuation of the coal strike for the last five months the situation was such that it was thought it could not be adjusted, until within the last 30 or 40 days there has been great hopes of an amicable adjustment. We feel we can see light in this direction now, although the former hopes have been blasted. Otherwise the situation of the jobbing Hardware trade would be quite satisfactory.

Manufacturers are still behind in filling orders for many kinds of goods upon immediate orders, and on these they make no promises for immediate or early shipments. Possibly the jobbing trade have never anticipated their wants to such a great extent as they have the past eight months. Many kinds of goods for which it was considered safe to place orders for fall trade in July have been ordered as far back as March, and owing to that precaution on the part of many houses stocks of goods are in very fair condition. Speaking for ourselves, we never had such a large and varied stock on hand at this time of the year as at the present writing. This, of course, to a large extent is found somewhat necessary owing to the large increase in the variety of new goods during the past few years. In fact catalogues issued five years ago would practically be almost obsolete owing to the changes of patterns and the variety of new goods that have come on the market during that time, and new catalogues up to date, which have recently been published by some of the large houses throughout the United States, have been a matter of positive necessity, as it has been in our own case. Our new catalogue shows an increase of probably one-third in additional kinds and variety over and above that contained in the catalogue of five years ago. All this shows the disposition of the jobbers to jump quickly at new goods, some of which have found ready sale and others slow sale, owing to the time it requires to talk them into a customer in the retail trade and the hesitancy on the part of many to add new goods to their stock. Of course, it remains only for the retail merchant to introduce these to the consumer to make their trade satisfactory, as the jobber introduces them to the retail merchant in hopes of increasing the variety of trade. The retail trade should realize the fact that department stores and catalogue houses are aggressive and will take new goods of this nature, and will take the trade unless the retail merchants are on the alert, aggressive and determined to keep the trade in their own hands.

We say this with all due respect to the articles in some recent issues of *The Iron Age*, as the writer feels he is safe in taking exception to the hesitancy which you claim jobbers show in taking up new goods. Our experience is quite the reverse from the impression you have formed possibly from some manufacturers and possibly from some undesirable (at least considered so by the jobber) goods. We think probably the editor of your paper, as well as some manufacturers, may have formed this conclusion from the actions of a few jobbers, but certainly all jobbers should not be classed with a few isolated cases. We feel our statement is correct in regard to the large and progressive jobbers of the country. Your remarks possibly are correct in regard to Paints, although quite a number of jobbers are taking these into their line; but many of the large cities have manufacturers of Paints within their own limits and they have traveling salesmen who visit the trade for an article that has heretofore been confined to certain dealers who make a specialty of these goods. But we think it is safe to say, convince the jobbers that there is a lack of representation by persons who make a specialty of these goods in their own city, and there is an opening for increased trade, and there are but few jobbers who would not jump at the opportunity. But outside of Paints and Oils we think your articles do injustice to the larger number of wholesale jobbing houses. If one will look over the illustrated catalogues recently issued by the large jobbing Hardware houses of the country we think the assertion we have made will be found correct, and we are very sorry to have the impression go abroad to the contrary, as we feel there is an injustice in it. Your articles in *The Iron Age* show great correctness, as a rule, on the conditions of the country and the efforts of the jobbing trade and we do not think you would knowingly make statements not in accordance with the facts and which may do injustice to the jobbing trade, whose every aim and every effort is to supply themselves with all kinds of goods that it is possible for the retail Hardware merchant to sell.

Baltimore.

CARLIN & FULTON.—Trade has kept up remarkably well, the result no doubt of generally excellent conditions of the country, and perhaps stimulated to some degree by expected advances in some lines, and on the other hand by the unexpected decline in Wire and Wire Nails with the possibility of their recovery.

This reduction in prices made by the American Steel & Wire Company seems very strange to the general public in face of the facts that Steel Billets are almost unobtainable except by importation; that the market quotations for foundry pig iron are $22 per ton as against $14.90 one year ago, which is an advance of about 50 per cent.; that many of the furnaces have been closed and cannot operate for lack of coke, while coke cannot be moved for lack of cars and locomotives; that labor is higher, and the demand generally throughout the United States upon the manufacturers for goods has been abnormal. Logically speaking, prices should advance in those very commodities (Wire and Nails) instead of declining, but what a forcible argument to present to the country when the political campaign begins against trusts and monopolies by showing that the greatest corporation in the world feels the force of competition to such an extent that contrary to all business expectations they have reduced prices instead of advancing them, and that they are neither a trust nor a monopoly to the extent that they can disregard competition.

It sometimes pays to let the market go temporarily, just as one sometimes loosens one's hold to take a tighter grip.

Locally the absorbing topic is the coal question, though in our more Southern market there is not the excitement over fuel that exists in this vicinity. We hope before many days the troubles will have ceased and that a reconciliation may be effected by which all may work harmoniously together.

Louisville.

W. B. BELKNAP & Co.—Business shows no signs of relaxation. There have been some adjustments of prices, more or less local, by the manufacturers of Wire and Nails, but not especially disturbing to those in the distributing trade, but possibly may be to what is known as "outside competition."

The mills seem all extremely well employed. Every other question is dwarfed by that of the coal strike, but we do believe that when the practical politicians of Pennsylvania, who undoubtedly are possessed of the astuteness of the proverbial Philadelphia lawyer, put their heads together that they will certainly "find a wy." They cannot be less resourceful than sentimental Tommy.

In the meanwhile, all sorts of devices are being employed to supply the demand—bricks soaked in kerosene, old plank pavements and round trip coal—namely, that which has been exported with a great flourish of trumpets and is now brought back as most valuable cargoes to our own shores again.

The outcome of these tremendous times of travail is often that some great invention or substitute is born into the world of manufactures and progress. Possibly, in this instance we shall have some new form of liberty, enlightening and warming the world at the same time.

We are unwilling to believe that with all this labor and labor trouble there shall be nothing greater than the *ridiculus mus*.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—The month of October is keeping pace with the past few months in point of trade, the volume of business being unusually large. There is a heavy demand for all kinds of winter goods and supplies, especially such goods as Stoves, Stove Pipe, Elbows, Coal Hods, Stove Boards, Fire Shovels and this class of goods. While the profit on these items is being reduced each year the volume of the business done is being increased.

Country merchants are also buying liberally of holiday goods. Cutlery, Lamps, Silverware, Toy Wagons, Velocipedes and such lines are being bought in large quantities and indications are that there is going to be a scarcity of such goods later on during the winter.

The retail trade seem to be paying their bills a little more promptly than usual. Many merchants are now discounting who have never done so before, and the condition of things generally throughout the whole South is most satisfactory. The reports that we get from our traveling men which cover the Southern States are better and moreencouraging than ever known before and the prospects for a large business next spring are most flattering.

Portland, Oregon.

CORBETT, FAILING & ROBERTSON.—We enter the last quarter of the year under most favorable auspices. The first week shows an increase of 39½ per cent. in clearings and the present week should show a much larger increase. That, too, without stuffing or running through balances the following day, as we clear balances in gold coin each day. The last quarter went out in a blaze of glory, as far as the Pacific Northwest is concerned, and we hope the last quarter of the year will finish in the same brilliant manner.

This week has seen the largest cargo put afloat that has ever left our port. Being 100 miles from the sea, it speaks well for the condition of our river channels that so large a cargo could leave at dead low water.

Trade is good and collections begin to show the result of a good harvest and prices for products that induce free selling.

Cleveland.

THE W. BINGHAM COMPANY.—There is continued activity in the Hardware trade and a good and healthy demand for all kinds of Hardware in this section, and a special loud call is made for fall goods, of which large quantities have been sold by the jobbers in this district.

Some difficulty still exists in getting goods promptly to supply the immediate demand. There is an immense consumption of all kinds of Hardware going on throughout the land, and manufacturers do not seem to be prepared for same, but are catching up fast on some lines.

Everybody seems to be prosperous and happy and desirous of spending their money, therefore trade is excellent.

New Orleans.

A. BALDWIN & CO.—There has been an increasing demand for all lines of Hardware during the past 30 days. All goods are moving in very large volume and trade is far in excess of any previous year. Conditions are all very favorable for a continuation of this state of affairs. Notwithstanding a weakness in some lines of product prices generally are being fairly well maintained.

The local street car strike has some effect on the output of the retail trade, but it is not injuring the jobbing trade to any extent.

NOTES ON PRICES.

Wire Nails.—The market holds firm at the reduced prices made by the American Steel & Wire Company and adopted by the leading independent manufacturers. There has been a feeling of increased confidence in the future stability of the market, which is evinced by an increase in demand. The regular quotations are as follows: Carload lots or mixed carloads, $1.90; less than carloads, $1.95, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days. For galvanizing Nails 75 cents per keg extra is charged and for tinning Nails the extra per keg is $1.50.

New York.—Demand in the local market, which fell off to some extent immediately after the announcement of a reduction in the price of Wire Nails, has become larger. Quotations are as follows: Single carloads, $2.05; small lots from store, $2.10 to $2.15.

Chicago, by Telegraph.—The largest manufacturers report a fair volume of business, but the independent mills are not securing many large orders. The jobbing trade has not been especially active, but there has been a fair degree of activity and a somewhat improved market, with sales made mainly on the basis of $2 in carload lots and $2.10 in less than carload lots, Chicago. Sales made at less than these prices are exceptional.

St. Louis, by Telegraph.—The demand for Wire Nails continues fair, and while prices are somewhat irregular $2.15 in small lots from store is the general quotation.

Pittsburgh.—We are advised that demand for Wire Nails is showing some improvement, and the general condition of the trade is much better in every respect than for some time. We quote Wire Nails at $1.85 to $1.90 in carloads, and $1.95 in small lots, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days. For Galvanizing Nails 75 cents per keg extra is charged, and for tinning Nails $1.50 per keg extra.

Cut Nails.—A meeting of the Cut Nail Association is to be held on the 16th inst., at which time the question of prices will be considered. Notwithstanding the fact that Cut Nails are now selling at higher prices than Wire Nails, there is a disposition on the part of some of the manufacturers to refrain from a reduction which would put them in their usual relative position. The result of the meeting will be awaited with interest. Quotations are as follows: $2.05, base, in carloads, and $2.10 in less than carloads, f.o.b. Pittsburgh, plus freight in Tube Rate Book to point of destination; terms 60 days, less 2 per cent. off in 10 days.

New York.—There is a moderate demand for Cut Nails at this point. Quotations for carloads and less than carloads are as follows:

Carloads on dock	$2.18
Less than carloads on dock	2.23
Small lots from store	2.30

Chicago, by Telegraph.—There has been a fair volume of business and the market has been in a more satisfactory condition, sales of carload lots being made at $2.10 to $2.15, and less than carload lots at $2.20 to $2.25, base, Chicago.

St. Louis, by Telegraph.—The demand for Cut Nails is limited and small lots from jobbers' stocks are quoted at $2.30.

Pittsburgh.—The Cut Nail Manufacturers' Association meets on Thursday, October 16, and it is possible a reduction in prices will be made, to conform to the recent reduction in Wire Nails. There is a fairly good demand for Cut Nails, and Iron Cut Nails continue to bring about 10 cents advance over Steel. We quote Steel Cut Nails as follows: $2.05, base, in carloads, and $2.10 in less than carloads, plus freight in Tube Rate Book to point of destination, terms 60 days, less 2 per cent. off in 10 days.

Barb Wire.—The reduction in price made by the American Steel & Wire Company has stimulated the placing of orders with manufacturers, resulting in more business than for some time past. Quotations are as follows: Painted, in carloads, $2.20; Galvanized, $2.50; less than carloads, Painted, $2.30; Galvanized, $2.60, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days.

Chicago, by Telegraph.—The largest manufacturers report considerable activity, but orders received by the independent mills have not been large. The market, however, has continued steady, sales being made mainly for Galvanized at $2.60 in carload lots, and $2.70 in less than carload lots, and Painted at $2.30 in carload lots, and $2.40 in less than carload lots, Chicago.

St. Louis, by Telegraph.—The volume of business in

the market for Barb Wire is not large at this time and prices are variable. In small lots from jobbers' stocks Painted is quoted at $2.50, and Galvanized at $2.80.

Pittsburgh.—We note an increase in orders for Barb Wire and the mills are booking more business than for some time. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount off for cash in 10 days: Painted, $2.15; Galvanized, $2.45, in carloads; less than carload lots, Painted, $2.20; Galvanized, $2.50.

Plain Wire.—Demand is showing some improvement, but orders are not numerous enough to absorb the capacity of the mills. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. for cash in 10 days: Carloads, $1.80; less than carloads, $1.90. The above prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	Plain.	Add Galv.
6 to 9	Base.	$0.30
10 Advance over base	$0.05	.30
11 " " "	.10	.30
12 and 12½ " " "	.15	.30
13 " " "	.25	.30
14 " " "	.35	.30
15 " " "	.45	.60
16 " " "	.55	.60
17 " " "	.70	1.00
18 " " "	.85	1.00

Chicago, by Telegraph.—There has been a fair movement on old contracts, a moderate volume of new business booked by the mills and a fair jobbing trade. In carload lots sales are made on the basis of $1.90, track, and less than carload lots at $2 from store, Galvanized selling at 30 cents extra.

St. Louis, by Telegraph.—Jobbers are handling a small volume of trade for Plain Wire. No. 9 is quoted at $2.10 and Galvanized at $2.40 in small lots from stock.

Pittsburgh.—Demand is improving to some extent and the mills confidently expect a larger business right along. We quote Plain Wire at $1.75 to $1.80, base, for Nos. 6 to 9; Galvanized, 30 cents extra for Nos. 6 to 14 and 60 cents extra for Nos. 15 and 16.

The Enterprise Mfg. Company.—Under date October 1 the Enterprise Mfg. Company, Philadelphia, Pa., announced the withdrawal of former quotations on Mrs. Potts' Cold Handle Sad Irons, the following prices going into effect on that date. Terms net 30 days, or 2 per cent. discount for cash in 10 days:

	In lots of not less than 10 dozen sets. Per set net.	In lots of less than 10 dozen sets Per set net.
No. E 50, with Tinned Caps	$0.75	$0.80
No. E 55, " " "	.72	.77
No. E 60, " " "	.85	.90
No. E 65, " " "	.82	.87
No. E 50, with Japanned Caps	.72	.77
No. E 55, " " "	.69	.74
No. E 60, " " "	.82	.87
No. E 65, " " "	.79	.84
No. E 30, Nickeled Solid Top	.95	1.00
No. E 40,	1.05	1.10

Family Outfits.

No. E 52	E 32	330	335	
$1.30	$1.70	$2.65	$2.40	each net f.o.b. Philadelphia.

Traps and Floats.—The J. M. Mast Mfg. Company of Lititz, Pa., make the following net prices per gross on Rat and Mouse Traps:

	Rat.	Mouse.
Blizzard	No. 1, $9.50	No. 12, $3.00
Old Nick	No. 2, 8.40	No. 30, 2.22
Joker	No. 3, 8.40	No. 5, 2.10

	Per gross.
Improved Snap Shot Mouse, 2-hole	$2.40
Improved Snap Shot Mouse, 4-hole	4.20

The following list prices of patent Nyssa Fishing Floats are subject to a discount of 50 per cent.:

Fishing Floats.

Two Colors, with Band.

Inches	1½	1¾	2	2¼	2½
Per gross	$8.50	$9.50	$11.50	$14.00	$18.00
Inches	2¾	3	3½	4	
Per gross	$20.00	$23.00	$29.00	$36.00	

Fancy Striped.

Inches	1¾	2	2¼	2½	2¾
Per gross	$9.00	$9.50	$10.00	$10.50	$12.50
Inches	3	3½	4	4½	5	6
Per gross	$14.50	$21.00	$25.00	$30.00	$35.00	$40.00

Conductor Pipe, Eave Troughs, &c.—An important meeting of the Associated Manufacturers of Conductor Pipe, Eave Troughs, &., was held on the 11th inst., and a reduction in price of about 7½ per cent. was made. The action was taken in view of the decline in the price of the raw material. The present prices to the smaller trade are given below, as well as a description of the different territories into which the country is divided, and according to which prices are graduated. The quotations which follow are for less than carload lots, there being the usual additional discounts to the large trade and buyers of carload lots:

EASTERN TERRITORY comprises all of the United States lying north of a line drawn from Newport News, Va., and following the Chesapeake & Ohio Railroad from Richmond via Lynchburg to Clifton Forge, Va. (including Norfolk, Va.), and the Ohio River; thence along the Ohio River to the Mississippi; the territory east of the Mississippi and north of the Ohio as far as the northern boundary line of Illinois; including Milwaukee, Wis.

Discounts recommended in Eastern Territory as follows:

Galvanized Conductor Pipe, Nested ..... 75 and 7½ %
Not Nested ..... 75 and 2½ %
Galvanized Eave Trough ..... 80 and 7½ %

THE CENTRAL TERRITORY consists of States of North Carolina and that part of Virginia and West Virginia lying south of the Chesapeake & Ohio Railroad; Kentucky, Tennessee, Missouri, Iowa and that part of Minnesota lying south of the line of railroad running from Sioux Falls, S. D., to Duluth, and all of Wisconsin except Milwaukee; also Northern Peninsula of Michigan.

Discounts recommended in Central Territory as follows:

Galvanized Conductor Pipe, Nested ..... 75 and 2½ %
Not Nested ..... 70 and 12½ %
Galvanized Eave Trough ..... 80 and 2½ %

SOUTHERN TERRITORY consists of the States of Mississippi, Alabama, Georgia, Florida and South Carolina, except the cities of Charleston and Savannah, which are placed in the Central Territory.

Discounts recommended in Southern Territory as follows:

Galvanized Conductor Pipe, Nested ..... 70 and 7½ %
Not Nested ..... 70 and 2½ %
Galvanized Eave Trough ..... 75 and 10 and 5 %

SOUTHWESTERN TERRITORY consists of the States of Louisiana, Arkansas and Texas.

Discounts recommended in Southwestern Territory as follows:

Galvanized Conductor Pipe, Nested ..... 65 and 10 and 10 %
Not Nested ..... 65 and 10 and 5 %
Galvanized Eave Trough ..... 75 and 10 and 2½ %

Nebraska, Kansas, Oklahoma and Indian Territory take the Central Territory discounts, but with freight allowed only to the Missouri River.

The territory lying west of these lines takes the nearest territory discounts. Freight to boundary line allowed. The cities on boundary line take discounts ruling in territory receiving the lower prices.

Terms and Conditions.

Extreme terms, 60-2-10 from time of shipment.

Delivery on contracts: All within 60 days from date of contract.

Nested prices not allowable unless 50 per cent. of the lineal feet will nest.

Territory prices: Governing prices are those in the territory into which the goods are shipped, and not at the shipping point.

Wagons or warehouse deliveries: Unnested Pipe same as Nested. No freight allowed on less than 250 feet.

Elbows and Shoes ..... 60 %
Miters, End Pieces and Drops ..... 25 %

No contract to extend beyond 60 days.

Actual freight allowed on Elbows and Shoes not to exceed 85 cents per 100 pounds, and no freight allowed on any shipment weighing less than 100 pounds.

Tacks.—There is substantial agreement among manufacturers in describing the Tack market as in an unsatisfactory condition. Notwithstanding the high prices ruling for raw material and the difficulty in obtaining it, there is a good deal of irregularity in the quotations on Tacks and prices are both low and uneven. There have been some conferences with a view to inducing a better condition of things, but the market does not as yet indicate that much has been accomplished in this direction.

Wrought Iron Pipe.—The market for Wrought Iron Pipe has been gradually tending toward slightly lower prices. This is principally on account of the competition of the outside mills, who are increasing in number and in the extent of their products. Prices on the small

sizes give especial evidence of the influence of competition.

Springs.—The market for Springs is characterized by a steady and strong tone, and the recent advance made by the manufacturers of ⅛ cent per pound is being generally maintained. The demand is active, and most of the manufacturers are full of orders.

Cast and Malleable Fittings, &c.—A slight advance has been made in the prices of Cast Iron and Malleable Iron Fittings and Valves. This is on account of the condition of the raw material market and the active demand which characterizes business, taxing the capacity of the manufacturers.

Tarred Roofing Paper.—While the manufacturers of Tarred Roofing Paper and kindred products have got control of the Eastern market by a system of agreed prices made early in 1902 it may not always be so. Outsiders are proverbially ready to compete for any trade that offers more than a normal margin of gain. One such instance is that of an Ohio company who last winter contracted for the bulk of the Cincinnati coal tar by-product, at the same time erecting a factory to manufacture this class of roofing materials. This company have an abundance of capital and it is thought will be a wholesome brake on the combined manufacturers. Then again we are advised of the existence of numerous small concerns in the West who are getting ready to compete for the trade in that territory. One important feature in connection with this industry is the constant addition throughout the country of numerous new process Coke Ovens, which save the coal tar by-product, the old style Ovens not doing so. It is confidently predicted that as these Ovens come into existence, many of which are already erected, the surplus coal tar raw material, estimated by those qualified to judge at 300,000 barrels annually, by the expiration of 12 to 18 months will be a trade factor that will test the resources of the combination to absorb, in addition to the normal supply. As this trade is a growing one the natural increase will require a portion of this extra supply of raw material, but the bulk of it will still have to be reckoned with.

Cordage.—The Rope market continues in about its previous condition. Demand keeps up for small lots, as buyers are not anticipating their requirements to any extent. Quotations range, on the basis of 7-16 inch and larger, from 9¼ to 9½ cents for Sisal and from 12¼ to 12½ cents for Manilla Rope.

Glass.—Some of the Window Glass factories commenced operations a week or more ago, and the plants of the American Window Glass Company and the Federation Window Glass Company expect to go into operation to-day, October 15. The new Independent Glass Company have opened offices at Columbus, Ohio. It is understood that they will control at least 600 pots and that they will co-operate with other manufacturers in trying to sustain prices. At a meeting of the Jobbers' Association, held in this city last week, it was decided to maintain former quotations. This action was taken in view of irregularities in price which have characterized the local market. Demand is very limited. The Jobbers' Association quotations are as follows for single and double strength Window Glass:

	Discount.
From store	88 and 5 %
F.o.b. factory, carload lots	89 and 5 %

Paints and Colors.—*Leads.*—There is a good consumptive demand for White Lead in Oil, as the pleasant weather has been favorable to outdoor work in this section. Quotations are as follows: In lots of 500 pounds and over, 6 cents per pound; in lots of less than 500 pounds, 6½ cents per pound.

Oils.—*Linseed Oil.*—The market has been weak and declining, City Raw having been reduced in price to 48 cents, in lots of five barrels or more, and to 59 cents in lots of less than five barrels, on October 10. Out of town brands are quoted at 45 cents for Raw in any quantity. The demand for immediate delivery is active, but no interest is taken in futures. A large amount of adulterated Oil is on the market, this being offered especially from points in the West at exeremely low figures.

Spirits Turpentine.—The local market has been strong all the week, owing to the active buying for export at the South. Prices have reached the highest point for the season. Quotations, according to quantity, are as follows: Southerns, 54½ to 55 cents; machine made barrels, 55 to 55½ cents per gallon.

PAINTS IN THE HARDWARE STORE.

THE letters published in our last two issues on the desirability of Hardware merchants handling Paints have attracted much attention, and we are in receipt of many letters from manufacturers and merchants in which the naturalness of Mixed Paints as a Hardware line is pointed out. Extracts from some of these are given below. They will be read with interest, especially by those merchants who have not yet seen their way clear to giving this line a place in their stock:

An Indispensable Line

From a Retail House in Indiana: We have read the articles in *The Iron Age* on "The Handling of Paints by Hardware Merchants" with interest and can only add to what has already been said that we have handled Paints in connection with our line for the last 18 years and we consider it a line indispensable to the welfare of our business. There is hardly a building or a factory that does not use more or less Paint, and it is for the accommodation of these customers that we are compelled to handle Paints. Moreover, there is a reasonable profit in the handling of them, so that we have come to consider the Paint business as much a part of our business as any other department. We would not dispose of it under any consideration.

A Neat and Profitable Line.

From an Indiana Jobbing House: As to the extent to which Paint is handled by the retail Hardware trade, will say that our experience only dates back about two years, but we found many merchants already handling Paint and more who were ready to take up an article which so readily commends itself to the Hardware Merchant as a line which is in every way adapted to the Hardware dealer and his customers.

Paint is put up in a neat package, is sold at a fair margin of profit to the class of trade who patronize the Hardware store and what argument can there be against the retail Hardware Merchant availing himself of the opportunity to increase his sales and profits and at the same time catering to the wants of his patrons.

It is our opinion that those retail Hardware dealers who have not already seen the advantage of handling Paint soon will do so, and that they will buy it of their Hardware jobber from whom they can purchase it to better advantage than from the manufacturer of Paints himself.

Paints and Varnishes are Legitimate Hardware.

From a Pennsylvania Manufacturer: We certainly think that Paints and Varnishes have a legitimate place as one of the lines in connection with the Hardware business. A number of our best customers are those in the Hardware line, particularly in the Eastern and Middle States, and it seems perfectly natural that they should handle our goods. In fact, it would seem strange if they did not include Paints and Varnishes in their stock. They are very satisfactory customers, which probably indicates that they are able to handle our products with a great deal of satisfaction to themselves.

Hardwaremen Beginning to Wake Up.

From an Ohio Manufacturer: It depends upon "the man behind the gun." The druggist sells Paint largely because he is alert and wide awake to the possibility of generous profits. There is a story, which I have never heard refuted, that a druggist at the close of the day counted $10 in his drawer for his day's sales. "Well," he said, "it is not much, but there is some consolation in knowing that $9 of that $10 represents my profit."

The Hardwaremen are accustomed to handle goods at a much smaller profit than 90 per cent., and are not wide awake enough to their own opportunities. Maybe they are beginning to wake up.

Hardware Stores the Ideal Medium of Sale.

From a Southern Manufacturer: Our observation and experience go to prove that Hardware stores are in better position to handle Paints successfully than drug stores or any other line. If a new building goes up Hardware must be delivered to it, and the Paints can be delivered at the same time. The accounts can be carried with the contractors for both Paints and Hardware. In fact, trade conditions show that Hardware stores are the best places to carry Paints.

Their Trade Increasing Among Hardware Merchants.

From an Ohio Manufacturing Concern: We believe, like a great many others who have written letters to your journal, that the natural tendency for the output of Paint is through the Hardware merchant. He is more capable, from the fact of handling the building material, and he thus handles more Paint and Glass. The drug houses principally in handling Paint shove it way back out of sight, and a customer calling for Paint would not know that they ever handled it from what they see in the drug store. We find that our trade is increasing among the Hardware people continually and they are beginning to wake up, which we believe is their duty in this matter.

Paint and Building Material.

From an Illinois Manufacturer: We agree most heartily with you that Paints belong in the Hardware store, as we feel that the man who is building should buy his Paint where he buys the rest of his building material. Although in many localities the Hardware dealer does not handle Paints, we think the time will come when no Hardware store will be complete without a line of Paints.

Hardware Merchants Among Their Most Desirable Customers.

From Manufacturers in Pennsylvania: We think your editorial in *The Iron Age* covers the ground in a very practical and thorough manner. Our experience is that the Hardware trade make excellent customers and are generally careful and businesslike people. This business contains some of our most desirable customers. We hope you will give as much Paint space as possible in your publication.

Importance of Carrying High Grade Paint.

From a Manufacturer in Ohio: No line is better for Hardware dealers provided the Paint is of high quality. Cheap Paint will injure the reputation of the store and in the long run cause loss of trade. High grade Paint, on the other hand, adds to the reputation of the store and increases the business both directly and indirectly.

Advantageous Position of the Hardware Merchant.

From an Illinois Manufacturer: We have carefully noted your remarks in your October 2 issue in reference to Paints as a rule belonging to the Hardware trade. There is no question as to the desirability of the Hardwaremen's account throughout the country, as they are certainly the people to handle Paints in preference to any other dealer, as they have splendid opportunities for getting a sale of Paints whenever the contractor comes to buy his Hardware for both new and old buildings.

Regular Hardware Lines.

From a Michigan Retail Merchant: The Hardware stores of Bay City and Saginaw have sold Paints, Oils and Glass since the writer has known anything about the Hardware business, 28 years. We think it a part of our business as much as Nails. The druggists do not keep Paints and Oils, as no one here would think of going to them for such goods.

Have Added Paints to Their Stock.

From a Retail House in Illinois: We have added Paints to our stock this year. We believe it will be a satisfactory addition to our stock. Our experience extends only over one season, but it is very satisfactory.

Paint Business Very Satisfactory.

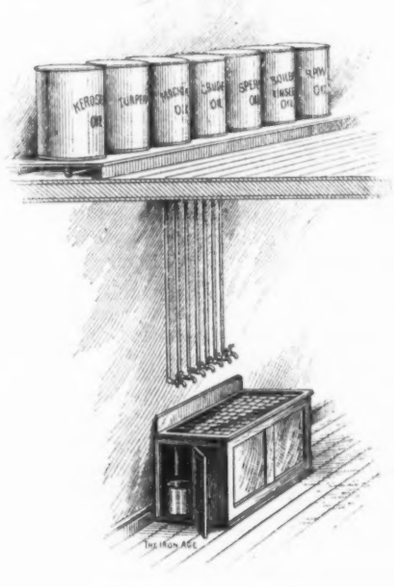
From an Indiana Retail Merchant: We presume the locality has something to do with the Hardware trade handling Paints and Oils. With us we find the business very satisfactory.

A Very Good Side Line.

From a Western Retail Merchant: We have handled Paints and Oils for the last 20 years and found them a good side line to handle in connection with the Hardware business. We sell White Lead, and Mixed Paint, and Brushes, and don't sell to painters. We find them too close buyers to sell to, but find that the other trade is O. K.

A METHOD OF KEEPING OILS.

THE method of keeping Oils in use in the store of J. M. Page & Co., Naugatuck, Conn., is clearly shown in the accompanying illustration. On the floor above the main salesroom are seven tanks in which the following products are kept: Kerosene Oil, Turpentine, Machine Oil, Crude Oil, Sperm Oil, Boiled Linseed Oil and Raw Linseed Oil. From these tanks run pipes, as shown in the illustration, to the salesroom on the floor below, at the lower end of each pipe being an ordinary brass faucet. Under these faucets is built a stand, the top of which is covered with a heavy wire mesh, below which is arranged a galvanized iron pan. At the lowest corner of this pan is an outlet pipe. The drippings from the pipes pass through the wire mesh into this pan and through the outlet pipe into a pail, which is placed as shown. This method has proven to be very satisfactory, being both clean and convenient.

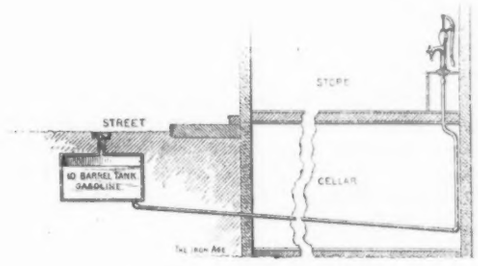


A Method for Keeping Oils.

STORAGE OF GASOLINE.

GASOLINE, owing to its dangerous nature, is a product against which insurance companies make stringent rules, permitting only a small stock to be kept in a building. To overcome this, a very ingenious device has been adopted by J. M. Page & Co., Naugatuck, Conn. The arrangement is shown in the accompanying illustration. In the street in front of the store, 3 feet below the surface is placed a tank holding 10 barrels. This is filled with Gasoline through a manhole. From the tank runs a pipe into the cellar and up to the store floor, where a force pump is fastened to it. At the end of the force

pump is placed a cock. When Gasoline is wanted the cock is opened and the handle of the pump is worked until the required amount of Gasoline is obtained. Then the cock is closed, preventing dripping. This device is



Street Storage of Gasoline.

very clever and is worthy of the consideration of merchants.

THE DECADENCE OF GUN MAKING IN ENGLAND.

BY A SPECIAL CONTRIBUTOR.

EARLY last summer I was seized with the delusion that I needed a Gun—a high grade, double barreled, hammerless, 12-gauge Shotgun. The fact that I had about as much use for such an implement of death as I had for a Kaffir assagai or a Filipino bolo in nowise abated my ardor to possess one. Most people are from time to time seized with manias of this kind, and I have them frequently. Well, I found the Gun I wanted and bought it. The dealer who sold it to me was a discreet man. He impressed me with the notion that no Shotgun made compared with the best English weapons, and one that he had in stock, reserved for some discriminating buyer, bore about the same relation to ordinary Shotguns that a Stradivarius violin bears to the average 20-shilling fiddle. I was impressed. What I paid for this priceless treasure is unimportant—not for me, indeed, but for the reader. In one sense it was worth what it cost. It set me on the quest of exact and useful Gun information, especially about English Guns; and as a monopoly of this information will not redound to my pecuniary advantage and may bring me into some share of the disfavor with which monopolies are regarded since President Roosevelt began talking about trusts, I see no good reason why I should not part with it for the benefit of whom it may concern. Perhaps if I could capitalize it the case would be different.

The decline of British industry has been exemplified in so many ways that it has become a question whether in anything she has fully maintained her ancient prestige. The latest instance to attract attention and set the students of industrial and commercial statistics to wondering whether the end of the world is at hand is found in the evidence, gained from a census of the trade, that the English Gun has met its Waterloo in the competition of the Continental manufacturers. There was a time, and it was not very long ago, when no sportsman thought he had a Shotgun worth talking about unless it was of authenticated English manufacture, London proved. The well-known British names were hall marks, and a fowling pice so stamped was considered worth the price asked for it, however much above that at which Guns known to be cheaper and assumed to be inferior were held. At the present time the man who wants a good Gun gets one of American manufacture; if he wants a cheap one he gets it of Continental manufacture. There is no middle grade, and if there was it is doubtful if the English Gun could fill it, since it is neither so good as to satisfy the critical nor so cheap as to satisfy the economical. The London *Telegraph*, in discussing this question, claims that the best Guns in the world are still made in Birmingham; but this statement will be challenged by every one whose opinion is entitled to consideration. Some of the Birmingham makes are undoubtedly good, but that they are the best produced, or even as good as the highest grade of arms produced in this country, no one but the makers believe.

The prestige of the English sporting Gun is something like that which still attaches to certain makes of English Cutlery, notably Carvers. Birmingham still has a trade in pieces which sell from £10 to £50 or £60, but not many of this grade are wanted and the industry languishes. They are not enough better than the cheaper products of other countries to commend them to any one but those who think that the largest armory is incomplete unless it contains one or more examples of old British names. From every point of view they are excellent weapons, but they cannot be made cheaply. The metal used in making the Damascus barrel costs about £30 per ton, and that for the twist barrel about £20 per ton. Good homogeneous steel, which answers every purpose, costs from £9 to £10 per ton. For all practical purposes homogeneous steel barrels are just as good, the advantage of the Damascus and twist metals having disappeared when the quality of a barrel ceased to depend upon the skill of the blacksmith who forged it. There is also a question, even among the experts, whether, in view of the rapid progress of the art of Gun making and the change of style from year to year, high intrinsic value in barrel metal is worth what it costs. A Gun quickly becomes old fashioned, and however perfect in material and workmanship one which is not strictly up to date is no better than one of the same type which cost less. As bric-à-brac they are almost equally interesting.

The Belgians have been the most clever and successful invaders of the field of the English Gun makers, whose trade in everything except fancy Guns they have practically killed. In the catalogues of the Belgian makers Double Barreled Breech Loading Shotguns are quoted from $2 to $6. These are very practical goods, and for such use as casual sportsmen can make of them are just as effective as English Guns costing twice as much. A Gun which the Belgian makers offer on the English market at 19 shillings 2 pence not only compares very favorably with a British Gun which the makers say cannot be made for less than 37 shillings 6 pence, but by many buyers is preferred as better finish and more accurate. There is an enormous sale for this class of Guns in the United States, also in England, and they are going all over the world. The Damascus and twist finish are imitated so exactly as to deceive even the elect, and the fact that these finishes possess the proverbial attribute of beauty in being only "skin deep" detracts nothing from their interest for the user. Even on the cheapest grade of Belgian barrels the tracery which is characteristic of the so-called Damascus metal is imitated so exactly that it requires an expert to tell the difference. As a result some of the more enterprising English manufacturers are administering the *coup de grace* to their distinctive industry—or what remains of it—by importing Belgian barrels to be mounted in British factories and sold as the "real thing." Probably it will not be long before the Damascus and twist barrels will go out altogether, and users will no doubt be quite as well satisfied with superficial etching as with the interweaving of fibers. It is stated on good authority that some of the English makers are now buying Guns nearly complete from Belgian factories, giving them an English finish, having them proved in Birmingham or London and selling them as high grade English Guns. My reason for thinking this is so is that I have one.

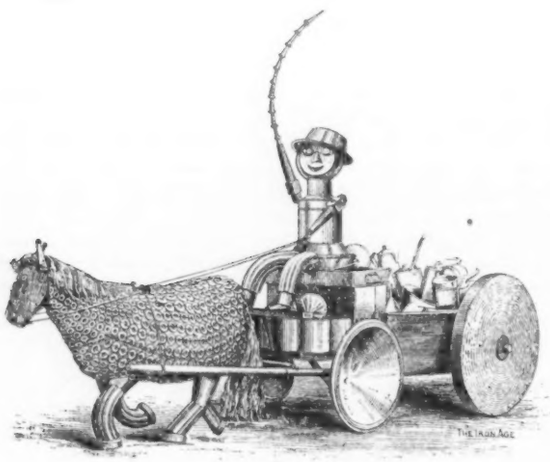
So serious and threatening has Belgian competition become that a delegation of Birmingham Gun makers was lately sent to that country to study the methods of manufacture, and especially the system of education at the Gun makers' technical school at Liége. The conclusion they have reached is, in brief, that the prestige which England has lost in the Gun business can never be recovered. The conditions of labor are all in favor of Belgium, and the agricultural system is an important factor. In their report they say: "Traveling as we did from Holland to the docks at Antwerp, which is practically going straight through the country, there was not a piece of land a foot square capable of producing but

was put into use by the tiller of the soil." This is in sharp contrast with the meager utilization of land in Great Britain. In connection with the Gun making industry it is usual to find action filers, barrel filers and stockers working in their little shops, while they direct or actually perform the profitable cultivation of a strip of land which gives them a living. The factories they found far and away ahead of those of England in cleanliness, order, equipment, good machinery and industrial organization. The Belgian mechanic is industrious, thrifty and economical, temperate in his habits and willing to work longer hours for less pay than his union dominated congener of England. The Birmingham deputation saw much that they did not approve of, but the net result was to convince them that the Gun trade which England has lost she cannot hope to regain, and that what she has managed to retain is likely to shrink to microscopic proportions within a very few years.

A TIN AND HARDWARE DELIVERY WAGON.

A UNIQUE display in the form of a delivery wagon with horse and driver that attracted much attention in the show window of J. P. Shoemaker, Laurens, Iowa, is shown in the illustration. It was arranged by W. P. Bartholow, who runs the tinshop in connection with the store.

The body of the horse was constructed over a frame of wood and Wire shaped like that of a horse. This was then covered with Screen Wire and then with cloth, over



A Tin and Hardware Delivery Wagon.

which were strung ¼, 5-16, ⅜, ½ and ⅝ inch Washers. The head was covered with Nails of different sizes and 1-inch narrow Butts. The ears were 4-inch Strap Hinges. Small Disks with an Upholstery Nail through them formed the eyes. Rope was used for the mane, tail and forelock. The legs were made of 2-inch Conductor Spout with Cooky Cutters for feet.

The driver was constructed of Tinware, as follows: A couple of Pudding Pans served as a head with a couple of Disks, Coffee Pot Spout and Measure Lip for eyes, nose and mouth respectively. A 6-inch Stove Pipe Collar and a 3-pint Pudding Pan composed the hat. A Pint Cup was used for the neck. The body was composed of two 2-quart Milk Pans, turned tops together, with a 4-quart Dinner Pail set on top of these. Two Wood Faucets composed the arms. In the left arm was screwed a small Screw Hook for a hand, in which he held the lines. The right was uplifted and in it he held a Whip made of Spouts of Bent Machine Oilers, as though he was going to strike the horse. His legs were of two 3-inch outlets for eaves trough and two 3-inch elbows. A couple of Nutmeg Graters served as feet. He wore a pair of goggles, which nicely completed the figure.

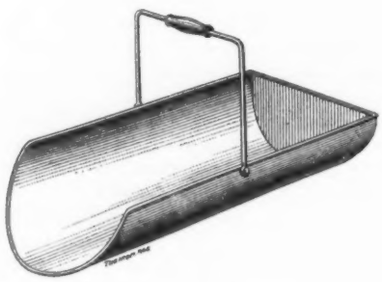
The Wagon was made by using two large sized Grindstones for hind wheels and a couple of Bread Raiser Covers for front wheels. A framework of wood was made to carry the weight of the load. A couple of Tin Bread Pans with a 9 x 18 inch Bread Pan across the tops formed the seat frame. A Crumb Tray served as a seat. A Floor Scraper was used for a foot board. The box was composed of Fruit Cans. This was then piled full of light Tinware thrown in any way.

Fork Handles were used for shafts and a Hammer Handle with a Screw Hook in each end for a singletree.

Masons' Line and Heavy Hemp Cord served as Harness and Bridle. A couple of 1½-inch Malleable Iron Rings were used on the Saddle for the Lines to pass through. A Screw Hook was used as a Check Hook. Two Brass Upholstery Rings served as Rings for the Bits. Furnace Damper Chain did ample duty as Traces.

PAN FOR FILLING NAIL BINS.

THE accompanying illustration shows a Pan used in store of J. M. Page & Co., Naugatuck, Conn., for filling the Nail bins with Nails from the kegs. This Pan is made of galvanized iron and is 20 inches long at the bottom and 17 inches at the top. It is 10 inches wide and 6 inches high. The bail is made of a ¼-inch round iron rod and has a wooden handle. Nails from the kegs are emptied directly into this Pan and from it into the



Pan for Filling Nail Bins.

Nail bins. It is found to be a convenience in the store and serves its purpose much better than the Coal Hod that is used in many stores.

C. W. GAUSE.

FOLLOWING up our announcement two weeks ago of the dissolution of the Hardware Buyers' Association as a buying agency, it is interesting to note as one of the results of that change the association of C. W. Gause with Dunham, Carrigan & Hayden Company of San Francisco and New York in the capacity of managing buyer, with headquarters at the office that they have for a long time maintained at 127 Duane street, New York. Mr. Gause, as many in the trade are aware, has been for six years manager of the Hardware Buyers' Association, and has filled that position with eminent success and to the satisfaction of those whom he represented as well as the manufacturers with whom he had relations, who appreciated the high principles on which the business was conducted by him. While the great house with which he has now associated himself are to be congratulated on availing themselves of his ability and experience as a buyer, his many friends in this city will learn with pleasure that he is to remain here and will wish him success in his new relationship.

CONSOLIDATION OF EDGE TOOL INTERESTS.

THE negotiations between the manufacturers of Axes, Hatchets, Scythes, and other edge tools, with a view to forming a strong consolidation, are still in progress and it is thought by some at least connected with the movement that the prospect for the successful consummation of their plans is encouraging. The report, however, which has been given currency in the daily press to the effect that the Kelly Axe Mfg. Company had sold out to the consolidated interests is emphatically denied by the company.

HOW TO SECURE ENGLISH TRADE.

BRITISH LETTER.

Office of *The Iron Age*, Hastings House, Norfolk St., London, W. C., Oct. 4, 1902.

IN *The Iron Age* of September 18 appeared an editorial dealing with some vital factors in Hardware export methods. The article has created much interest on this side of the Atlantic, and I have received a number of interesting and suggestive letters dealing with the subject. One or two of them run to considerable length, but I venture the opinion that there is not a single letter hereinafter produced which is not worth serious consideration by energetic American exporters. I have so many letters on my desk dealing with this subject that in my *embarras de richesse* I hardly know where to begin. I will first submit a letter received from probably the largest Hardware jobbing firm in this kingdom. John Shaw & Sons, Wolverhampton, Limited, not only cover in a very thorough way the whole of Great Britain, but they have well established branch offices in Calcutta, Cape Town, Wynberg in Natal, Montreal, Barbados, with responsible agents in Valparaiso, Havana and throughout the Far East. I reported many months ago that John Shaw & Sons, Wolverhampton, Limited, had opened an American department. The manager of this department, whom I know to have a competent knowledge of the American Hardware trade, writes me as follows:

From John Shaw & Sons, Wolverhampton. (Wholesale.)

Having had brought before our notice a leading article in *The Iron Age* of September 18, 1902, on this subject, we venture to think that a few remarks from the English merchant's point of view would not be without interest to your readers on the other side. In our opinion the correct and only satisfactory way to market American goods in this country is through the medium of merchants, and whether the transaction is between merchant and maker direct, or through a commission agent, is immaterial to us as merchants, so long as makers or agents confine themselves to the jobbing trade, and do not attempt to do both the jobbing and retail trade. It may be taken as a fact that if a merchant in this country is favorably impressed with a line of goods he will put them in stock, and thus through the medium of his salesmen they are within the reach of practically every retailer in the country, whether large or small, and are therefore much more likely to become more extensively known among users than would be the case providing the line was offered to the retail trade by an agent carrying no stock; for the following reason: That the agent can only afford to visit the largest buyers in the country, and though the possibilities are that he may secure good orders from the select few who can buy sufficient to make a shipment, the goods are placed beyond the reach of the smaller buyer, who, unless he can buy from stock in this country, will not touch the line at all.

Uniform Quotations to Wholesaler and Retailer.—The trade in this country, on many well-known lines, is simply in a state of chaos, through manufacturers placing the export of their products in the hands of agents, who do not hesitate in attempting to do both the retail and the jobbing trade. We ourselves are obliged to pay, in many instances, the same price as is paid by retailers who appear on our books as customers. If an agent forms the opinion that, in addition to the jobbing, it is necessary to work up the retail trade, we should even then have no objection providing there was a margin of profit left sufficient to reimburse the jobber for the outlay of capital and the necessary expenses incurred in selling the line.

Agents Who Carry No Stock.—Another pitfall which is open to manufacturers who do not appoint sole agents and are outwardly content to do their business through such merchants as carry stock is allowing their line to be handled by agents who are not willing to carry stock, but prefer to sell direct from the factory to dealer. We have no hesitation whatever in stating as a fact that the agents of the class just mentioned do their best to make the line an impossible one to the jobber, inasmuch as they will sell comparatively small lines, which ought to be executed from a jobber's stock, direct from the factory, assembling a quantity of such packages in New York and bringing them over at a minimum of freight.

Correcting a Trade Difficulty.—In this connection we would cite an instance wherein it gives us pleasure to refer to a line made in America and offered for sale in this country through their American agents. Some little time ago an English firm of exporters got into possession of this line through an American house, and commenced selling at such a price that they made the line entirely useless to an English jobber and without any addition in turn over to the American manufacturers, for the reason that while the firm in question were selling, the jobbers' output was entirely at a standstill. The matter was taken up by the English jobbers, who refused to handle the line any longer unless the conditions were made more satisfactory, with the result that the English firm mentioned, who were cutting prices, had their supply cut off, and it is now impossible for any British merchants to offer this line unless they are prepared to place an order for a fixed quantity. This plan, we believe, has given the greatest satisfaction; and, in fact, we know of one house at least who have, under these conditions, taken up the line and are introducing it into a part of this country which it had not reached heretofore; and, in addition, we have yet to hear that the manufacturer has suffered in any way for the action he took in the matter.

The "Business-Pleasure" Traveler.—We would also sound a word of warning to the body of American manufacturers who are in the habit of combining business and pleasure during their trips to this country; many of them come over, and during the course of their wanderings come across a dealer who is offering a competitive line to their own, and, we suppose, they are struck with the feeling: "Here is a man who is not selling my line of goods; I must go in and see why." Without making certain that some merchant has not been endeavoring to sell his goods, and making himself cognizant of the price at which his line is being offered, he enters into conversation with the dealer and endeavors to impress him as to how much better than his competitor he can offer similar lines, and often for argumentative purposes quotes a price which is the same as he is charging the jobber. We do not think that any great amount of business is done thereby, and it is not at all likely to create good feeling between jobber and manufacturer, inasmuch as it is not very pleasant for the jobber's salesman to call upon this same customer, perhaps very shortly after the manufacturer has been there, and in making a further attempt to sell that particular manufacturer's line be met with the remark: "Oh, yes, I have had a call from the maker of this line and he quoted me better prices."

In summing up, we would add that we think the jobbing trade of this country will always be found ready to support manufacturers who are loyal to their interests.

From an Old and Influential American Merchant. (Wholesale.)

My second letter comes from a gentleman who is equally well known on both sides of the Atlantic, but who does not desire any publicity given to his name. He writes as follows:

Respecting the article in *The Iron Age*, page 50, I have glanced through it and must say that I sympathize with

HOW TO SECURE ENGLISH TRADE Continued

the manufacturers who found commission merchants unsatisfactory. I fear that in expressing any opinion on this matter it would be considered biased on our part, because we have never believed in commission merchants selling American goods in this market, and anything that we say in this line would appear to be more personal than general.

GOODS NOT INTRODUCED BY COMMISSION HOUSES.—Our own experience shows that the American goods that are on sale here have never been introduced by commission houses, but by houses who take up the goods and work them by personal introductions. When the line of goods is then somewhat known here the commission agents are very glad to step in and offer to supply the goods at cut prices, being willing to execute the order at a small commission when the building up of the trade has cost them nothing. We also think that manufacturers make a great mistake when they send out quotations promiscuously, not knowing whether the parties are users, dealers or agents.

From James Keeves & Sons, Limited. (Wholesale.)

About a year ago I told American readers about James Keeves & Sons, who are located in Boundary street, Shoreditch, London, East, and how they had during the last few years, under the guidance of James Keeves, Jr., developed their business to enormous proportions, their large catalogue being one of the features of the Hardware trade in this country. James Keeves writes me as follows:

With reference to the Hardware leader in *The Iron Age* of September 18, page 50, and the special case mentioned therein, looking upon the facts as they stand, it would appear that the course taken by the manufacturers in this case was the only one open to them under the circumstances, in fairness to themselves, though it would appear from the sequel that the manufacturers did not make a very profitable ending to the business after all; but probably they comforted themselves with the reflection that they were laying foundations that would broaden later on and pay interest on the outlay of money and energy in time to come.

EXPORT TRADE; PERMANENT OR TRANSITORY.—The questions discussed in reference to American export trade in general are somewhat extensive, and appear to us to arrange themselves under and revolve around the central idea of the aims of parties contemplating export business—viz., is it entered upon as a permanent addition to existing trade, or as an occasional spasm to be taken in hand when certain events warrant or impel its adoption? In other words, is the export business to be taken in hand seriously and put upon a permanent basis that is to be fostered and pushed in season and out of season and upon all occasions, or is it simply taken up as a temporary relief for goods usually produced by the house, which the home market cannot absorb at the time, and export of which will be stopped in normal times at home, or, lastly, is it looked upon as a plan to dump down the product of some accidental incident that ocasionally arises, which make it desirable to dispose of certain goods for what they will fetch regardless of any future business? If the latter is the aim of the exporter, it will be a good job for all concerned if a severe lesson is administered in his first transaction, as it thoroughly demoralizes the market for these goods for a long time and does no one any good at the finish.

THE RESULT OF WITHHOLDING SUPPLIES.—The second position (as far as the manufacturer is concerned) is not much better in the long run, as if a line takes and the supply ceases after a market is made it will simply mean that probably on his next essay in his former market he will have to take the place of the previous example, as the people who were abandoned before will be chary of biting again at the same bait.

SOME OBSERVATIONS ON ESTABLISHING EXPORT TRADE.—If, however, a permanent export business is desired, the question put by your leader as to the best means of accomplishing that end becomes a very interesting one, and although the answer to the question (whether direct representation, as against representation by a commission house at home, or a wholesaler in the country under review) bristles with difficulties, each in particular cases has advantages which can only be decided upon by the merits of the article it is desired to introduce and the means of the disposal of manufacturer, but, speaking generally, if any other than direct methods are chosen the central aim and necessity is to get hold of the proper house or houses to handle the particular line in question, as it ofttimes happens that goods appeal to more trades than any one house, even though that be a good representative one, can deal with properly, for though it may stand first in its own branch, it may have little or no influence or scope in the other branches where the line can be profitably introduced; and thus (in the writer's opinion) many lines are better introduced through several channels than through a single one, as the fact that some other house or houses are pushing the line in a different though kindred direction is an incentive for each one handling it to push harder.

These remarks apply more especially, of course, to articles that are simple in themselves and therefore easy to handle and push, or are in such universal demand that they appear to both wholesaler and retailer as worthy of the necessary time and trouble which much be taken to interest the public (who ultimately take the goods) and which they feel will be repaid by a sale.

THE SALESMAN SPECIALIST.—The ground having been so far cleared, the manufacturer having decided in his own mind that the article he has to sell is worthy of the effort, that his resources and patience are equal to the task, the first question has been decided—viz., that of direct or secondary representation—for in the case of simple or universally used articles the secondary is usually sufficient. But there can be no shadow of doubt that in the case of complicated affairs, or goods requiring intimate knowledge of some special kind for efficient pushing, there is no other course open but for the manufacturer either to take the whole matter in hand himself by his own staff or to help the secondary agency he employs by sending over a specially qualified man to do the missionary work among the proper people, while leaving to the houses who handle it a certain profit on the sale for the use of the facilities placed at the manufacturer's disposal and the use of their name and connection as a basis for the expert to work upon, and in this way much expense and disappointment may be saved both to the manufacturer and the agent.

SUPPLIES MUST BE CONTINUOUS.—Another important factor is the accessibility of supplies while the growing is in progress and in the early periods of its increase, and in all cases it is necessary that sufficient supplies shall be at hand for immediate wants, as very few people are willing to risk much on a new line, and business is in the long run better served—especially in its early stages—by continuous small additions to a man's stock than by choking him up with a bigger line at the start, as there is always the tendency for him to get disgusted with any line that from any cause whatever hangs fire, and every time it is looked at only makes matters worse.

TOO MUCH EXPECTED IN THE BEGINNING.—This latter aspect of the matter is one that has been insufficiently looked at by American manufacturers, as the great desire upon their part is for big things at short notice, and consequently large lines are expected from the start, which practice has killed many lines that would have stayed with judicious handling. This desire for big things in foreign trade is probably due to the American manufacturer gauging what he considers proper quantities for export from his home experience with similar goods, as, by all accounts available on this side, there is certainly more enterprise shown by the prominent wholesale houses in the States with lines that please them at the time of presentation than is the case in Europe; but this is doubtless largely helped and directed by the greater wilingness of the community to try a new line.

MORE JOBBERS PROPORTIONATELY ABROAD.—Again, the fact must not be overlooked that there is com-

HOW TO SECURE ENGLISH TRADE Continued

paratively a much smaller number of jobbing houses in the States who handle Hardware as compared with this side, as here the number is by far larger if gauged by the turnover and population, and no single concern that the writer knows handle anything like the large number of classes of goods as is the custom on your side. Consequently a European house when taking up any line appeal only to a section of the available market, whereas manufacturers on your side are gauging their prospective requirements by their own jobbing houses, who handle a much larger variety of goods than is the custom in Europe. Therefore, though they may not have a larger numerical connection than a European house, their horizon is wider and more comprehensive, and one of the potent facts to be learned in European trading is the much more minute subdivision of trades than is current on your side, and correspondingly the different methods necessary to deal with them.

STABILITY IN PRICES.—Another important factor is comparative stability in prices when once they have been settled, and it is undoubtedly a better policy to get a slightly higher price at the start that will be maintained within reasonable limits than a low price at the start and a much higher one later on, as the medium price will become current and settled and all will be satisfied, whereas when wide fluctuations occur they are the cause of inevitable trouble.

COPYING SUCCESSFUL LINES.—Another factor American manufacturers will find has arisen on this side in late years much more than ever before—viz., that successful lines from any source unprotected by patents are speedily copied either as they arrive or with small improvements and put upon the home market to compete with the imported article, and, although in some cases the imitation is the reverse of flattering to the original, in many instances within the writer's knowledge they have driven the imported articles out and replaced them. While this is certainly bad from the outside manufacturer's point of view, it is just as certainly defensible from the home manufacturer's point of looking at the matter, as it is a certain fact that many of the Hardware lines imported into Europe from the States cannot come upon their merits as *bona fide* business transactions where cost and profit are considered in relation to price, but a considerable proportion of the latter at least must come from the extra price obtained in the home market, and this fact is often worked upon by agents when introducing a native product against an outsider. In some cases it may be contrary to fact, still it is a factor to be taken into consideration.

GROWTH OF EUROPEAN COMPETITION.—Finally, it must not be forgotten that while America has been booming at home during the last few years Europe has not been altogether idle, and it is a fact to be taken into consideration that the next American invasion will find the ground harder to break up than previously, and there will be a greater tendency to meet lines with lines and methods by counter moves. The fight will be harder and closer than ever before, and although the writer's sympathies are naturally with the home manufacturers his desire is to see the best men win, for that in the long run is the only sure means of progress and prosperity.

I happen to know that James Keeves & Sons, Limited, buy very largely from American agents in this country, and if once they take up a line it is a certainty that it will be pushed with vigor and discretion.

From John George & Sons, Limited. (Wholesale.)

A few years ago the goods sold by John George & Sons, 18 Great Alie street, London, East, were almost entirely British. But they were among the first to realize the importance of the American trade, and at the present moment I believe over 50 per cent. of their goods are of American origin. Their opinion, therefore, must carry weight:

MARKETABLE GOODS; PROMPT DELIVERIES.—From our past experience in introducing American goods in Great Britain, which has extended over 30 years, we have found that the most satisfactory results were obtained by not attempting to push the sale until we were certain that we had an article exactly suited to this market and were also in a position to execute all sample orders at once. So many Americans begin their operations in Great Britain by sending over a traveler who takes a large quantity of sample orders; they then find that some slight alteration has to be made, and this, together with the time taken by the railway and shipping companies for delivery, means that the sample orders are executed three or four months after the traveler's call. The result is that many of the buyers have quite forgotten the conversation which they had with the traveler and have lost any enthusiasm which they may have had for his goods. It is proverbially more difficult to introduce a new article in this country than in the United States, and delay over the first transaction is bound to create a bad impression among buyers. Also the traveler has considerable difficulty in finding out who are the best houses to call on, in arranging terms of credit and in avoiding bad debts.

HOW GOOD RESULTS HAVE BEEN OBTAINED.—We think that in nearly all cases the best results have been obtained when the American manufacturers have selected one large jobbing firm, with a good connection among the retailers in all parts of the Kingdom, who will agree to purchase a stock and push the sale in all parts of the country, and have confined themselves to him. This jobbing firm can advise the manufacturer of any slight alterations which may be desirable and can await pushing the goods until he has a stock and can execute sample orders at once. Soon after the sample orders have been sent out his travelers must make second calls and follow up what has been done, and however well the goods have taken on at first, it will be necessary continually to look up all buyers in every part of the country. By selling their goods in this way American manufacturers are saved all cash risk and also the inevitable trouble and expense which are incurred with a number of small accounts.

From Charles Nurse & Co. (Wholesale and Retail)

The next letter, from Charles Nurse & Co., 182 Walworth road, London, S. E., is of especial interest because it comes from a firm who have both a wholesale and a retail business. John Osborn, the proprietor of this concern, visited America last year and upon his return I transmitted his impressions to *The Iron Age*. He says:

While I fully appreciate the position of the various large American commission houses and the value which they have been to the various manufacturers, whose goods they have in many cases been largely instrumental in introducing into this country, there are still many points which I consider can be most satisfactorily settled by direct communication between the manufacturer and the distributer on this side. One fault, if I may so term it, of the commission houses is the tendency which they have of making extreme bottom prices to comparatively small buyers, the result of which only too often leads to the undue cutting of prices generally. The manufacturer who places his goods through such channels exclusively fails to obtain reliable information as to which of the houses on this side have been most largely instrumental in the introduction and sale of their goods.

ADVERTISING EXPENDITURES OVERLOOKED.—For instance, during the last few years I have expended upward of $25,000 in catalogue advertising alone, apart from an almost equally large amount in newspaper advertisements, and I find in many cases that this expenditure is altogether overlooked or altogether disregarded by our friends on the other side, who make no distinction whatever in price between our orders and those of small retailers, whose requirements are not a tithe of our own; with the result that many of such lines are being cut in price throughout the country to-

HOW TO SECURE ENGLISH TRADE Continued

an extent which tends to make it difficult for us to handle such lines with any satisfaction. The plan adopted by some American houses of allowing special extra quantity discounts on large annual turnovers seems to me the most equitable manner of meeting such difficulties, and where houses like my own have gone to unusual expense in introducing lines of goods it also appears to me to be only reasonable and equitable that the manufacturer whose goods are so represented should bear some proportion of the cost of such advertising.

I would draw particular attention to John Osborn's point in regard to allowing special extra quantity discounts, as my observation leads to the conclusion that many personal difficulties can be obviated by resort to this method.

From William Cruger Cushman. (Agent.)

I venture to express my views as to the best methods of marketing American products, in comment on the article on this subject appearing in *The Iron Age* in the September 18 issue. My first comment is that the average American manufacturer seeking for a foreign outlet does not seem to be farsighted in one respect, for he fails to realize that in times of peace one should prepare for war. When a manufacturer's business is dull at home he naturally seeks a foreign outlet for his surplus stock, but if he waits until trade is dull at home before seeking to build up a foreign trade he is confronted with the obstacle that there has been no previous demand created for his goods, and consequently he does not find the required outlet at a time when he needs it. Therefore he should be laying his foundations long before he expects to occupy his house. These remarks are particularly true of American manufacturers at the present time, where they are having such a large home demand that they are experiencing great difficulty in keeping pace with their current business. This condition of course cannot last indefinitely, as the natural laws are bound to prevail regarding the regular recurrence successively of trade rivivals and trade depressions. It is therefore wisdom on the part of American manufacturers to take steps now to secure a foreign demand for their goods before the inevitable dull times come at home, even if these steps require the shipment of a certain amount of stock much needed at the time for their home trade.

THOROUGHNESS AS ESSENTIAL IN FOREIGN AS IN DOMESTIC TRADE.—Another point is that in seeking foreign trade the manufacturer must adopt as vigorous and thorough measures as those used in building up his home trade—spasmodic circularizing, dabs at trade paper advertising or sending out an occasional sample in response to some inquiry will not build up a foreign business. What is needed is direct representation right on the ground by somebody having the manufacturer's interest sufficiently at heart that his gods can be shown and pushed day in and day out, to large trade and small, and such a representative should know the line thoroughly and urge it to the exclusion of all competing lines. The manufacturer should be willing to pay as liberally for this service as he would in building up a trade in a new section of his home market.

STOCK CARRIED AT CENTRAL DISTRIBUTING POINT.—It is also most important that the manufacturer should be prepared to carry stock at some central distributing point in the foreign market that he is seeking, for it is difficult enough at best to introduce new goods in a foreign market where the trade may be wedded to certain established standards to which they are accustomed, without laboring under the additional great disadvantage of not being able to fill orders for perhaps six weeks from receipt, while the old fashioned manufacturers right on the ground can assure immediate delivery.

CONFORMING TO FOREIGN CONDITIONS.—Last of all, the manufacturer should be prepared to conform as nearly as possible to the requirements of the foreign market, whether it be in the manner of packing his goods, or in alterations in material, designs, finish, weight or gauge. It is not a profitable task to drive water up hill, and a great stride is gained when the manufacturer stands ready to give the trade what it wants.

In regard to W. C. Cushman's remark, whose address is 19 Chapel street, Milton street, London, E. C., about prompt delivery of goods from stock in this country, it will be observed that the same idea is expressed in other letters, particularly those of James Keeves & Sons, Limited, and John George & Sons, Limited. W. C. Cushman is well qualified to express an opinion, for he has had experience as a trader both in New York and London.

From Pinchbeck Brothers. (Agents.)

The next letter is interesting because it is from a firm, Pinchbeck Brothers, 71 Queen street, London, E. C., who have been cultivating the American trade only during the past year or two, and their experiences therefore in obtaining American trade are naturally fresh in their memory. Observe the reference here to continuity of supply—a point which I have often dealt with under the more querulous title of "capriciousness" of supply:

We have read the interesting article on "American Export Trade" published in a recent issue of *The Iron Age*. We consider it a word of timely advice to those manufacturers in the States who are desirious of cultivating a British trade. From the little correspondence we have had with manufacturers in that country we have found them but little disposed to adapt their methods, terms and conditions to the convenience of buyers here. They seem to prefer to do all their export business through jobbers on the other side. This apparent indifference may be the result of having more business at home than they are at present able to cope with, but if in the future they should want to use our market as an outlet for their surplus products they will, in our opinion, have to adapt themselves more to the requirements and conveniences of the British buyers than they seem willing now to do.

REPRESENTATIVES ON THE SPOT.—We think, in order to do themselves justice and develop their trade here, that they will find it necessary to have responsible and properly accredited agents acting for them on the spot selling in their name and from their price-lists, which should be printed in English currency. Goods should also be quoted free house and invoiced in the name of the manufacturer.

IRREGULARITY AND FICKLENESS IN SUPPLIES.—From our own experience and what our friends tell us, the one great fault with American manufacturers is that they give no continuity of supply, shipping to this market when it suits them and withdrawing these supplies when it does not. This is very objectionable to the British jobber or merchant, as if he takes up lines he likes to be able to continue running them always.

Any manufacturer when considering coming into our market should make up his mind, if he comes, to come to stay.

From Thomas Danks & Co., Limited. (Retail.)

I have thus far given letters from merchants and agents. I have also received two communications from *bona-fide* retail establishments, both carrying American stocks. The first comes from J. N. Greenall, the managing director of Thomas Danks & Co., Limited, Thurland street, Nottingham. Thomas Danks & Co., Limited, have a retail establishment second to none and have made a specialty of heating and electrical work. J. N. Greenall, who writes the letter, visited America a few months ago, went carefully into American Hardware methods, brought back many hints, and I have no doubt gave equally valuable hints to his friends on your side. As a retail ironmonger, therefore, his opinion is worth having:

HOW TO SECURE ENGLISH TRADE Concluded

In the department of "Hardware" in *The Iron Age* of September 18 you discuss the best methods of "Getting a Foothold Abroad," or "How to Increase or Make a Start with an Export Trade." The article is a very good one and deals with the position very well. Yet the views of one on this side of the Channel, with a fairly extensive knowledge of the Hardware trade in England and with a slight acquaintance with American manufacturers, might be acceptable to some of your readers. No one plan is suitable for every case, but each must be considered on its own merits. It is generally admitted that experience is worth a good deal of theory, and we have in this country many American houses doing a successful business, whose history your London representative is well able to give. Most of these have direct representatives resident in London, but I regard the article as not particularly intended for these very large firms, but rather for manufacturers who have a few specialties and whom it would not pay to open a London warehouse.

THE OUTLINE OF A PLAN TO ESTABLISH A TRADE.—Speaking generally, I should adopt the following plan: Given a good firm who are determined to follow the thing up, are prepared to give sharp deliveries and are quite sure that they have the goods suitable for the English market, the price of which, taking quality into consideration, would bear a favorable comparison with the English made article, and prepared to maintain for 12 months the prices at which the goods are at first offered—for nothing is more objectionable to an Englishman than to be offered a price, and after ordering, to be informed that he must pay an increased price—let a principal or one of your present travelers, who must be a man not only able to sell but also able and willing to learn and form a reliable opinion as to the probability of the venture proving a financial success, be set apart for the work. Equip him with the necessary samples and literary matter for a two or three months' tour, determining to bear the initial cost of introduction yourself. This is where the mistake often commences. It is impossible to get a man worth having to spend the necessary money and time with no guarantee of return, for first orders seldom pay expenses. He calls upon the principal Hardwaremen in large towns and secures all the orders possible, or finds out the reason for not doing so. Having actually opened accounts, say one in every large town, divide the country into six sections—England, North and East, South and West; one for Ireland and one for Scotland—and appoint a good wholesale house for each district, making quite sure your agent has not a similar line which will pay him equally well, but pay him to take your agency to prevent competition; you then have only six customers to watch, which is quite enough.

Some may say that this introduces a middleman. Yes; other trades may do without the middleman, but not the Hardware trade. As a matter of fact, many retail Hardwaremen in this country have special and particularly good reasons for keeping in with the middleman. I hope the remarks I have made here will be taken in good part by your American readers. They at least are the result of my experience as a practical business man in a typical English town.

From Jones & Co. (Retail)

Jones & Co., Talbot House, Lichfield, whose short, bluff letter I here produce, have for some time past been *intrigued*, as the French say, with American methods. They advertise with American versatility and color, and are quick to recognize an American article if they can sell it. The letter is useful as conveying the impression of a retailer living in a small average English town, and the advice, though short, is practical:

If your friends do not wish to do business through a good commission house the best thing is to send a smart salesman direct to the trade with samples and attractive printed matter to enable the goods to be properly pushed before the public and generally to wake up the trader in the way he should sell them. The salesman might also take a public room for a few days and advertise it to get the people to come in and see the show. Let his trader friend be there busy taking orders. Everything depends upon a good start. This city has only about 7000 inhabitants, although it is much older than Birmingham. We have a large mining and agricultural population in the surrounding district. We find it difficult to introduce new patterns, although cheaper and sometimes better than the old ones. In a good many cases we have to get the sort they and their grandfathers used or lose the order.

A Final Remark and a Grumble.

It will be observed from the foregoing that readers of *The Iron Age* on this side of the water can be quite frank and have some valuable advice to offer. By a coincidence a letter reaches me this morning from a friend in Glasgow whose experience with American houses would seem to be discouraging. He is a young man and only recently started in business. He writes:

I am pleased to say I am still forging ahead, having now seven representatives in the United Kingdom, including the cities of London, Liverpool, Sheffield, Newcastle and Dublin; also representatives in Australia, South Africa, and am just now appointing one for the United States and Canada.

THAT TIRED FEELING.—Mention of American manufacturers makes me feel a bit cold, as I have had unsatisfactory experiences with some of them. American manufacturers have gone down a peg in my estimation. I find the Germans much more obliging, and now I am opposing in this country a strong American firm who could have had a successful agent in me. It would make you smile if you knew the reason negotiations fell through. This same firm I am about to oppose on their own native heath.

I wonder whether the American firm who came to loggerheads with this enterprising young trader quite realized what they were doing. It would seem that not only have they themselves lost an energetic representative, but they have in some small degree contributed to an unfortunate opinion now held by a gentleman who came to me two years ago anxious to take up American agencies, and who wrote to a number of American houses whose names I gave him. There is a moral in this too obvious to be expressed.

REQUESTS FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

Interior Mercantile Company, Canyon City, Ore., have been incorporated with a capital stock of $10,000, and will carry on the wholesale and retail business in Shelf and Heavy Hardware, Stoves and Tinware, Agricultural Implements, Sporting Goods, &c. The company will be pleased to receive catalogues, price-lists, &c., concerning the above lines.

A. B. Ware & Co. have just opened in their new two-story building in Columbus, Ga. They would like catalogues and quotations on Shelf and Heavy Hardware, Sporting Goods, Wooden Ware and Household Specialties, &c. They will mostly do a wholesale business.

D. S. Darlington, proprietor of a retail Hardware store on the West Side, Chicago, has sold his stock and fixtures through Geo. H. Trout & Co. of Chicago, from whom the stock was originally purchased, to J. E. Ansley, who will continue at the old stand.

B. C. Trueworthy has disposed of his Hardware, Stove, Crockery, Farm Implement, Seed and plumbing business to A. G. Hanson, who will continue at Palmyra, Maine, as heretofore.

OHIO HARDWARE DEALERS' MUTUAL INSURANCE COMPANY.

AT the last meeting of the Ohio Hardware Association, which was held in Columbus last February, a committee was appointed to procure the organization of the Ohio Hardware Dealers' Mutual Fire Insurance Company. This committee has been faithfully at work ever since the meeting. The difficulties at times seemed too great to overcome, but on August 13 at a committee meeting Geo. M. Gray of Coshocton was urged to go out through the State and make a thorough canvass. He met with great success. Mr. Rahe of Cleveland, Mr. Guyton of Ada, J. P. Duffy of Greenville, Geo. B. Meyer of Cincinnati, C. C. Fouts of Middleton and also J. C. Jones, Columbus, and Mr. Shearer of Roney & Shearer, Dayton, were of material assistance to Mr. Gray. As a result the Ohio Hardware Dealers' Mutual Fire Insurance Company were duly incorporated and organized during the past week. They have received their license from the Insurance Department of Ohio and are now a full fledged organization and ready to transact business. The company expect to receive their policies from a lithographer by the 15th inst. and the policies subscribed for will be promptly issued.

The following persons were duly elected directors: H. F. Rahe of Cleveland, G. V. Guyton of Ada, Geo. B. Meyer of Cincinnati, J. P. Duffy of Greenville and Geo. M. Gray of Coshocton. Mr. Duffy was chosen president and Geo. M. Gray secretary and treasurer. The principal office of the company will be at Coshocton. The first annual meeting of the company will be held at the same time and place as the next meeting of the Ohio Hardware Association.

This company is not formed for the profit of stockholders, but to obtain insurance at actual cost. It will be operated in the most economical manner possible and every dollar of profit over and above the cost of insurance will go back to the policy holders. The secretary will be pleased to receive applications from those desiring to insure with the company and to answer any inquiries that may be addressed to him on the subject.

READING HARDWARE COMPANY'S SHIP HARDWARE CATALOGUE.

READING HARDWARE COMPANY, Reading, Pa., and 96 to 98 Reade street, New York, have prepared for distribution an illustrated catalogue of 32 leaves contained in a binder that permits of additions as the line increases. On one side of each leaf are shown various articles of distinctively Ship Hardware, the matter being complete, except as to prices, which are listed on separate pages, suitable space being provided on each leaf for writing in list or net price, as the dealer prefers, thus making a catalogue that can be shown to any customer. The goods are either bronze or brass, and four finishes are regular, others being made to order. Those regularly provided are highly polished, unpolished, fine emery and coarse emery finishes.

MOORE & HANDLEY HARDWARE COMPANY'S FIRE.

HALF of the block occupied by the Moore & Handley Hardware Company, Birmingham, Ala., was destroyed by fire last week. The loss on buildings and stock is estimated at about $200,000, virtually covered by insurance. The other half of the block was not injured by the fire. The company also have another large building elsewhere in the city, which of course is unhurt. They are now securing additional quarters for warehouse purposes, and will go right ahead with their business as heretofore. They fortunately have a three-story building, 140 x 150 feet, nearly completed in another part of the city, and will be able to utilize this for storage. The company are already installed in their office and are receiving and shipping goods.

NEW ENGLAND HARDWARE DEALERS' ASSOCIATION.

THE New England Hardware Dealers' Association held its first autumn meeting at the United States Hotel, Boston, Wednesday evening, October 8. At 5 p.m. a meeting of the Executive Committee was held at which considerable business was transacted. The usual dinner was served immediately after the meeting of the Executive Committee. Seated at the head table were President Sewall D. Balkam, Secretary James A. Farless, Treasurer Henry M. Sanders, Anthony S. Morss, former Presidents D. Fletcher Barber, William D. Parlin and George W. Burditt and Charles A. Burditt. The dinner was of the usual excellence and was partaken of by a good company of members and their guests. After the dinner the records of the last meeting were read and approved and President Balkam made an address of welcome and announced that Eugene N. Foss, treasurer of B. F. Sturtevant Company and candidate for Congress from the Eleventh Massachusetts District, who was to have been the principal guest of the association and to make an address on "Canadian Reciprocity with the United States," was unable at the last moment to be present.

The next meeting of the association will be held December 10 and will be observed as annual ladies' night of the association. The committee for that evening are E. Loring Richards, chairman; Charles E. Adams, D. Fletcher Barber and James A. Farless. This occasion is always an interesting one and the committee are making preparations for a most enjoyable time.

TRADE ITEMS.

F. L. STELLWAGEN, sales manager of the Reading Hardware Company, together with W. H. Clark and Orton Hill of the selling force, have been putting in a few days at the Chicago branch of the company, which is under the management of W. H. Bennett.

THE J. BARTON SMITH COMPANY of Philadelphia, Pa., manufacturers of Sheep, Grass and Hedge Shears, Bit Braces, Screw Drivers, &c., anounce that they will not have any representatives on the road this season and in the future will give their customers the benefit of the saving caused by this departure, quoting prices to those in the trade who apply for them.

THE AMERICAN APPRAISAL COMPANY, Milwaukee, have embodied a number of testimonials from their clients in a neat pamphlet entitled "The Only Way," referring to the adjustments of fire losses. The company's purpose is to furnish complete and accurate invoices, inventories and plans of manufacturing plants, elevators, warehouses, hotels, public buildings, banks and office blocks, guaranteeing proof of loss in case of fire and data for the carrying of insurance. The testimonials given are reinforced by a list of manufacturers and other clients for whom appraisals have been made, alphabetically arranged and classified by States.

THE Eastern and foreign sales departments of the American Bicycle Company, which have been located in New York City, have been moved to Hartford, Conn. An office force of nearly 100 has been transferred to Hartford.

THE GLASBRITE COMPANY, 15 Prospect street, Cleveland, Ohio, are offering a Paste in tin cans for cleaning windows, enameled ware, glass, china, Crockery, solid silver, nickel and plated surfaces, cut glass jewelry, marble, &c. Cleaning does not depend upon friction, it is explained, because there is no grit in the Paste, also there is no soap in the composition and it does not leave streaks. It is applied with a damp cloth, and then rubbed off, leaving the article with its original brilliancy. The company refer to the utility of Glasbrite in factories, where the windows become unusually greasy and dirty, the foreign matter being effectively removed and a fine polish substituted.

Squires Bros. have succeeded Geo. Willing in the retail Hardware, Harness, Farm Implement, Buggy, Wagon and Furniture business in Broken Bow, Neb.

PRICE-LISTS, CIRCULARS, &c.

WRIGHTSVILLE HARDWARE COMPANY, Wrightsville, Pa.: Illustrated catalogue and price-list of Blind, Shutter and Gate Hinges, Sash Pulleys, Door Hangers and Rollers, Latches, Casters, Sad Irons, Hammers, Toy Tools, &c. The catalogue contains nearly 150 pages and represents an extensive variety of goods in the Hardware, House Furnishing and Toy line.

LUITINK & SONS MFG. COMPANY, Milwaukee, Wis.: Illustrated catalogue devoted to Luitink's Adjustable Sliding Door Track and Hanger. A feature of this device is that the adjustment is entirely in the track, the Hanger being nonadjustable.

R. O. STETSON, Greenfield, Mass.: Illustrated catalogue and price-list of the improved Stratton Spirit Level, including Carpenters', Machinists' and Masons' Levels, Pocket Levels and Level Vials. The pamphlet is addressed "To the Man Trying to Find His Level."

THE R. BLISS MFG. COMPANY, Pawtucket, R. I.: Catalogue No. 25, illustrating Tool Chests, Book Racks and Corner Brackets, Hand and Bench Screws, Clamps, Vises, Tool Handles, Field Croquet, &c.

R. W. WHITEHURST COMPANY, Norfolk, Va.: Catalogues relating to Hose Reels; Lawn, Road and Golf Ground Rollers; Wine Presses and Cider Mills.

J. B. SIPE & Co., Allegheny, Pa.: Japan Oils. These are referred to in a pamphlet as designed for use in place of Linseed Oil for painting.

WINTER BROS. COMPANY, Wrentham, Mass; Wm. H. Littell, 127 Duane street, New York, direct representative: Catalogue and price-list of the Thistle brand of Taps, Dies and Die Stocks.

BAKER MFG. COMPANY, Evansville, Wis.: Catalogue No. 31, devoted to Monitor Wind Mill Goods, including different styles of Wind Mills, Hitching Post Heads, Tank Heaters, Pumps, Pipe Tools, Valves, Fittings, &c.

MERCHANT & Co., Philadelphia, Pa.: Catalogues of Metal Tiles and Shingles, Roofing Plates and Star Ventilators.

W. O. TALCOTT, Providence, R. I.: Illustrated catalogue and price-list of Belt Hooks. These include Talcott's Wilson, Clinching, Combination, Acme Steel and Crown Wilson Hooks.

THE CLEVELAND STAMPING & TOOL COMPANY, Cleveland, Ohio: Lava Enameled Ware, Solid Steel Polished and Tinned Goods, Hotel Ware, &c. The company issue a catalogue showing these goods. The company carry in stock a full line of Lava Ware, mottled outside and white inside. They can also furnish these goods in solid color, blue outside and white inside.

RACINE MALLEABLE & WROUGHT IRON COMPANY, Racine, Wis.: Catalogues of Wagon and Harness Hardware and Specialties.

J. WISS & SONS COMPANY, Newark, N. J.; John H. Graham & Co., New York, export sales agents: Catalogue of Shears and Scissors, Tinners' Snips, Pruning Shears and Button Hole Cutters.

THE FANNER MFG. COMPANY, Cleveland, Ohio: Catalogue relating to Kitchen and House Specialties, Arctic Stove Trimmings, Chaplets and Iron Toys.

THE WILLIAM WILCOX MFG. COMPANY, Middletown, Conn.: Padlocks. An illustrated catalogue is devoted to the company's entire line of goods, including Struck Up Steel and Brass Padlocks, to which new patterns are being added from time to time; also their line of standard patterns of Wrought Steel Padlocks, to which they have made additions.

KEMP MFG. COMPANY, Toronto, Ont., Canada: Illustrated and descriptive catalogue and price-list, 174 pges, of Enameled Ware, Stamped and Pieced Tinware, Tinners' Trimmings, &c.

SAWYER HARDWARE & SUPPLY COMPANY, Pawtucket, R. I.: Revised price-list of the Sawyer and Wilson Belt Hooks. Additions have been made to the latter line in the way of Double Leather Belt Hooks for 4½, 5 and 6 inch belts.

WASHINGTON TOOL COMPANY, Owatonna, Minn.: Larson Pincers. An illustrated catalogue refers to these goods as indispensable tools for farmers, blacksmiths, carpenters, mechanics and machine and bicycle men.

THE GOSHEN CHURN & LADDER COMPANY, Goshen, Ind.: An illustrated circular and price-list of the goods they manufacture, consisting of an improved oval Churn and single and Extension Ladders in great variety.

THE BOSTON BELTING COMPANY, Boston, Mass.: Pamphlet illustrating American Underwriters' Cotton and Linen Fire Hose, conforming with the specifications of the Associated Factory Mutual Fire Insurance companies and the National Fire Protection Association, by whom the Hose has been recommended and accepted. Underwriters' Couplings, and Underwriters' Play Pipes are shown which conform in material and construction to the specifications of the Associated Factory Mutual Fire Insurance companies; also a Hydrant and Hose House, the style of which is recommended by them.

TIMMIS & CLISSOLD, Bound Brook, N. J.: Illustrated catalogue and price-list of Pattern Shop Supplies, such as Alcohol, Shellac, Glue, Brushes, Sandpaper, Dowels, Metal Letters, Figures and Stamps, Fillet and Fillet Tools, Vises, Rapping Plates, Steel Rules, Steel Tape Measures, &c.

SIMEON L. & GEORGE H. ROGERS COMPANY, Hartford, Conn.: Electro Silver Plated Flat Ware and Cutlery. Catalogue No. 4, containing 81 pages, shows extended lines of these goods in a variety of patterns and styles, including goods put up in silk lined boxes.

JAMES WARNOCK & Co., Galt, Ontario, Canada: Illustrated catalogue and price-list of Axes, Hatchets, Adzes, Chisels, Drawing Knives, Hammers and Sledges, Wedges, Picks and Mattocks, Cant Hooks, Peaveys, &c. The company call special attention to their line of Chopping Axes and also to their Lumbering Tools. Concerning the latter they refer to the new pattern of socket on their Peaveys, a fin running from point of socket to base of hook, allowing the use of a light but very strong socket.

THE SUNLIGHT LAVA COMPANY, Chattanooga, Tenn.: Sunlight Burners. A mailing card sent out by the company shows these Burners in five styles.

THE UNITED STATES GRAPHITE COMPANY, Saginaw, Mich.: Pamphlets relating to Graphite Paint and Lubricating Graphite made from Mexican Graphite, the company owning the Santa Maria Graphite mines in Sonora, Mexico.

F. REISSMANN, West Point, N. Y.: Circulars illustrating the Perfection Sandpaper Holder, the Rafter and Polygon Gauge and the Perfection Rule Gauge.

THE STARR MFG. COMPANY, Halifax, N. S., Canada: Thirty-sixth annual catalogue, devoted to Acme Hockey. Rink All Metal Skates and Wood Top Speed Skates.

THE CLEARFIELD MFG. COMPANY, Clearfield, Pa.: Catalogue 1902-1903 of children's Wagons, Wheelbarrows, Sleds, &c. The latest additions to the company's line include Iron Axle Wagons, Steel Barrows, Steel Patrol Wagons and Steel Geared Spring Wagons.

READING STANDARD MFG. COMPANY, Reading, Pa.: Illustrated folder devoted to Metal Cutting Tools and Tool Holders, Pyramid Lathe Tools, Boring Tools for lathes, Face Milling Cutters, Adjustable Rose Chucking Reamers and Adjustable Counterborers and Facing Bars. Also illustrated catalogue of Reading Standard Bicycles.

H. O. NELSEN, Knoxville, Tenn.: The Valley Forge Wrought Steel Fences. Catalogue G shows a variety of Fences and Gates for different purposes, Window Guards and Grills, Wrought Roof Crestings, Balconies, Stairways, Settees, Hitching Posts, Vases, &c.

ERIE SPECIALTY COMPANY, Erie, Pa.: Catalogue relating to an extensive line of Cork Pullers and Screws, Lemon Squeezers, Chill Shakers, Ice Shavers, &c. Owing to the constant additions to their line the company issue a catalogue at the beginning of each year, these being mailed to their regular trade and to others on application.

THE SOUTHINGTON CUTLERY COMPANY, Southington, Conn.: Catalogue of Crescent Safety Razors, Stropping

Machines and Shaving Sets. The company also manufacture Pocket Cutlery, Razors, Wood Screws, &c.

THE DOMINION WIRE MFG. COMPANY, Montreal, Toronto: Catalogue and price-list of Wire, Wire Nails, Screens, Jack Chain, Wire Coat and Hat Hooks, Staples, Bright Wire Goods, Spring Cotters, &c.

THE SMITH MFG. COMPANY, Waynesboro, Pa.: Catalogue No. 12, devoted to general Iron Work. This illustrates Fencing, Gates, Steel Swings, Settees, Tree Guards, Fire Escapes, Brackets, Window Guards and Shutters, Stable Fixtures, Steel Towers and Tanks, Jail Cells, &c.

THE BUHL STAMPING COMPANY, Detroit, Mich.: Catalogue No. 2, relating to Royal Galvanized and Japanned Steel Ware. Also folder illustrating and describing the National Feed Box for horses.

THE BUCHER & GIBBS PLOW COMPANY, Canton, Ohio: Catalogue No. 103, 235 pages, relating to Gibbs' Imperial Hand, Gang and Sulky Plows, Spike Tooth, Spring Tooth, Disk and Spading Harrows, Land Rollers and Cultivators.

E. E. SCHOENING & BRO., 305 North Twelfth street, St. Louis, Mo.: Illustrated catalogue of Hardware Specialties for stove and furniture dealers. The firm manufacture Stove Pipe and are in a position to make prompt shipments.

THE RAYMOND MFG. COMPANY, Corry, Pa.: Catalogue relating to High Grade Wire Springs Anti-Rattlers, Broom Holders, Coat and Hat Racks, Carpet Whips, Axle Washers, Pump Leathers, &c.

A. V. TAYLOR & Co., Cincinnati, Ohio: Printed matter devoted to White Enameled Letters and Figures, Enameled Iron and Steel Signs, Advertising Sign Novelties, Enameled Name and Door Plates, Number and Bell Plates, Trade-Marks and Emblems, &c.

M. S. BENEDICT MFG. CO.'S CATALOGUES.

M. S. BENEDICT MFG. COMPANY, East Syracuse, N. Y., makers of Silver Plated Ware and Metal Goods, have just issued a set of new catalogues of which they have printed an edition of 25,000 and are distributing them among the trade generally. The set includes catalogues Nos. 20, 21 and 22, which will be sent postpaid by the company upon the request of any dealer. Catalogue No. 21 contains 182 pages and is devoted to Silver Plated Hollow Ware, Hand Decorated Ware with Silver Plated Mountings, Cut Glass and Carving Sets. Catalogue No. 20 relates to Silver Plated Flat Ware, Salts and Peppers and Napkin Rings. Catalogue No. 22 is devoted to Sterling Silver Mounted Ebony Goods, Sterling Silver Mounted Manicure Sets, Toilet Sets, Ormolu Gold and Silver Plated Frames and Novelties and Ormolu Gold Plated Hand Burnished Clocks.

Rosebrooks & Cummins, West Medway, Mass., have disposed of their Hardware business to Sewell E. Kingsbury and Wilford Davison, who will continue under the style of Kingsbury & Davison. The stock comprises Shelf and Heavy Hardware, Tinware, Agricultural Implements, Sporting Goods, Crockery, Wall Paper, Paints, Oils, &c. Messrs Rosebrooks and Cummins have removed to Webster, where they have bought a larger business in the same line.

T. R. James of Fort Worth and J. R. Clemens of Cleburne, Texas, have bought two lots on Main street, Frisco, Texas, and will erect a fine building for the Hardware business, which will be carried on under the style of J. R. Clemens & Co. They will handle general Hardware, Buggies, Wagons, Harness, &c.

J. B. Paul of Portsmouth and John C. Trefethen of York Beach, Maine, have purchased the branch Hardware store of W. E. Paul at York Beach and hereafter the business will be conducted under the style of J. B. Paul & Co.

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AMONG THE HARDWARE TRADE.

Joseph Combel has moved his Hardware business from Bay St. Louis to Biloxi, Miss.

E. P. Olstead has sold his Hardware, Stove, Tinware, Farm Implement and Sporting Goods business in Wayne, Neb., to Terwilliger Bros., who will not, however, take possession until January 1 next.

Sparta Hardware Company have succeeded the Johnson-Davis Hardware Company in Sparta, Mo.

R. D. Martin has withdrawn from the Fullerton Hardware Company in Tecumseh, O. T. The business continues without any change in style. The company have lately added a warehouse to their facilities and are increasing their stock.

Frank Ayers has succeeded J. A. Elligg in the Shelf and Heavy Hardware, Stove, Tinware, Agricultural Implement and Sporting Goods business in Allice, Texas.

McCarty, Pierce & Co. are successors to R. B. McCarty in the Hardware, Stove and Agricultural Implement business in Milburn, Texas.

R. A. McGregor, who has been in the Hardware business in Bellaire, Ohio, for more than 30 years, has transferred his entire stock to the McVey Hardware Company, a newly organized firm, consisting of Robert McVey, H. A. Lichtenberger and H. S. McGregor, all well-known active business men of Bellaire. Mr. McVey, who has been identified with Mr. McGregor for a period of 25 years, will have charge and manage the business. The storeroom will receive a general overhauling, and a new metal ceiling will be put in. The establishment will be electrically lighted.

Thomas R. Moore has lately opened a new store in Hubbard, Ohio, and handles a line embracing Shelf and Heavy Hardware, Stoves, Tinware, Sporting Goods, &c.

Turner Hardware Company have removed their Hardware, Stove, Tinware and Agricultural Implement business from Washington, Ga., to Thomson, where they are now located.

C. H. Peter has succeeded C. H. Peter & Co. in the Hardware, Stove, Agricultural Implement and Sporting Goods business in Bluff City, Kan. Mr. Peter has just taken possession of a new large store building, 36 x 80 feet in dimensions.

J. F. Wozab has admitted a partner in his business in Humboldt, Neb., and the style is now Wozab & Ford. The sale of Agricultural Implements has been dropped and furniture taken up, so that the line now handled comprises Hardware, Stoves, Buggies and Furniture.

Charles E. True and Chas. A. Rice have purchased the controlling interest in the Sun Hardware Company, Rising Sun, Ohio. Mr. Rice was formerly connected with the W. Bingham Company of Cleveland, and Mr. True with the Cleveland *Press*. The company have a capital of $15,000, and do a retail business in Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Sporting Goods, Buggies, &c.

Joseph H. Gilmore has bought the Hardware store formerly owned by the Seeley Estate, Jefferson, N. Y.

Jno. P. Key has recently engaged in business in Asher, O. T., handling Shelf Hardware, Stoves and Tinware, Agricultural Implements, Wagons, Buggies and Sporting Goods. Asher is a new town in a fine cotton country.

Frank F. Bael, Hardware merchant, Trenton, N. J., who located in that city two years ago, buying out the Trenton Hardware Company, has just made another deal by purchasing the stock of Sieger & Miller, 138 South Broad street, Trenton. The stock consists of Hardware, Stoves, Paints, Oils, Glass, House Furnishing Goods, Lamps, &c. Mr. Bael expects to run two stores hereafter, one being located on North Broad street and the other on South Broad street.

The Canadian Hardware Company have opened a store at Sparks, O. T. The stock carried includes Shelf and Heavy Hardware, Stoves, Tinware, Sporting Goods, &c.

MISCELLANEOUS NOTES.

Two New Caliber Winchester Repeating Rifles.

The Winchester Repeating Arms Company, New Haven, Conn., and 312 Broadway, New York, have put on the market two new Winchester repeating rifles, so far as the calibers and cartridges to be used with them are concerned. One of them is the 1895 model box magazine repeating rifle to handle a new smokeless powder cartridge, known as the Winchester .35 caliber, which they allude to as the most powerful shooting cartridge, at both long and short ranges, ever offered. Rifles for this cartridge are made with 24-inch round nickel steel barrels, making them especially suitable for hunting purposes. The diameter of the bore is .350 inch; depth of rifling, .004 inch, and the twist one turn in 12 inches. The magazine holds four cartridges and one cartridge can be carried in the chamber. This rifle is finished with a straight grip stock and forearm of plain walnut, and weighs about 8½ pounds. Rifles of this caliber can be furnished with rifle butts with steel butt plates, or shotgun butts with either steel or rubber butt plates, without extra charge. The extras furnished for the model 1895, .30 army rifle can be supplied for the .35 caliber at the same list prices; but octagon or half octagon barrels or pistol grip stocks cannot be furnished for this gun. The Winchester .35-caliber cartridge embodies high velocity and consequent flat trajectory, great energy and striking power, making it a very desirable cartridge for hunting the biggest known game. The cartridge has a 250-grain soft point metal patched bullet, special smokeless powder and a muzzle velocity of 2200 foot seconds, developing a muzzle energy of 2685 foot pounds. Still another improved rifle and cartridge is the model 1886, which has been adapted to handle a .33 caliber cartridge. In this arm the bore is .330 inch; depth of rifling, .004 inch, and twist one turn in 12 inches. It is made in solid frame or take down style, 24-inch round nickel steel barrel, straight grip stock of plain wood, shotgun butt and rubber butt plate. This rifle, with a half magazine, will hold four cartridges in magazine and one in chamber; a full magazine holds seven cartridges in magazine and one in chamber. The gun weighs about 7¾ pounds. Rifles with full or half magazines, rifle butt stocks and fancy walnut straight or pistol grip stocks can be furnished. Octagon or half octagon or interchangeable barrels cannot be furnished for the .33-caliber rifle. The following are the essential features of the cartridge for this rifle: Bullet 200 grains; loaded with special smokeless powder; gives a muzzle velocity of 2050 foot seconds and muzzle energy of 1868 foot pounds.

Hemp's Combination Floating or Sinking Minnow Bucket.

Hemp & Co., St. Louis, Mo., are offering a minnow bucket with sunk ice pan top. The minnow chamber is made of galvanized wire cloth, provided with an air chamber, and can be lifted from the outside bucket, which is made of best quality of tin plate, japanned and ornamented. The air chamber permits the galvanized wire minnow chamber to float when lifted from the outside tin bucket and placed in the water, or it may be sunk by filling the air chamber with water. The minnow chamber is large, and the oval and round shapes in which the bucket is made are referred to as preventing the minnows being bruised while taking them from the galvanized wire chamber.

Cylinder Stable Lock and Flush Handle.

Reading Hardware Company, Reading, Pa., and 96-98 Reade street, New York, are manufacturing the Vassar sliding door knob locks, as here shown. Fig. 1 illustrates the lock one-third size. This high grade cyl-

Fig. 1.—Cylinder Sliding Door Lock and Key.

inder lock is designed for fine stables, fire engine houses, or any building requiring good grade hardware and freedom from likelihood of injury to horses in passing in or out. The lock has a plain bronze front and strike and

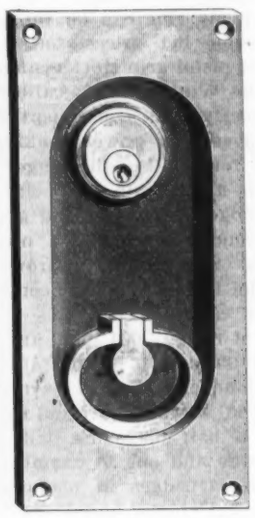


Fig. 2.—Flush Cup Escutcheon and Drop Handle.

bronze bolt, and is 5 x 4 inches in size, extra heavy. They are put up one lock in a box with two bronze cylinders and three keys. The locks are operated by flush cup handles from both sides, as seen in Fig. 2, if so desired, or regular knobs can be used instead. The flush cup escutcheon and drop handle here shown is plain bronze, natural finish, 8 x 3¾ inches in size and put up one pair in a box. It will be seen that with the flush latch bolt and rounded strike, together with the flush handles, a nervous or sensitive animal cannot be injured by the hardware, which is both handsome and secure.

Steel Toggle Bolt.

The Steward & Romaine Mfg. Company, 124 North Sixth street, Philadelphia, Pa., are offering steel toggle bolts, catalogued as No. 1 style, as shown in the accompanying cut. These are made in eight sizes and lengths, from 3-16 x 2½ inches to 5-16 x 6 inches. The heads are pivoted to turn down parallel with the bolt, so that, for instance, a 3-16-inch bolt passes through a ⅜-inch round hole, and will sustain a weight of 400 pounds. This is referred to as a much greater weight than an iron bolt of the same diameter will sustain. These bolts are

Steel Toggle Bolt.

threaded to within 1 inch of the head. The bolts are designed for securing molding, brackets, or any fixtures to walls or ceilings constructed of fire proof material, such as hollow tile, marble slabs, metal ceilings, or any place where a nail or screw is not satisfactory. The bolts are also useful for gas and steam fitters when running lines of pipe on ceilings or partitions.

The Winchester Single Shot Rifle, Model 1902.

The Winchester Repeating Arms Company, New Haven, Conn., are offering the single shot rifle shown herewith. This resembles closely the company's 1900 model, but is an improvement on the latter in several details. The stock of model 1902 is polished and finished with a blued steel butt plate. The trigger guard is of a new design, and fulfills the purposes of a pistol grip. By a change in form of the trigger and sear the rifle illustrated has a shorter trigger pull than the model 1900. A new peep sight has been substituted for the open rear sight, and the sights of every gun are adjusted by shooting. This is a take down rifle, which can be taken apart easily and quickly by unscrewing the thumb screws underneath the forearm, which releases the barrel and action from the stock. The action used on the gun is of the bolt type, consisting of few parts so as to be exceedingly simple. When the gun is cocked the action is locked against opening until the firing pin falls. This permits carrying the gun cocked without liability of the action jarring open. The gun is cocked by pulling

The Winchester Single Shot Rifle, Model 1902.

rearward on the firing pin, which is made with a knurled head to afford a good grip. The barrel is round, 18 inches long, bored and rifled. The gun has a straight grip stock, the length of pull being 12¾ inches, drop at comb 1½ inches, and drop at heel 2¾ inches. The length of the gun from muzzle to butt is 33¼ inches. The model 1902 is furnished only as herein described.

The New Universal Vise.

The accompanying cuts represent some of the adjustments and uses of the new Universal tool makers',

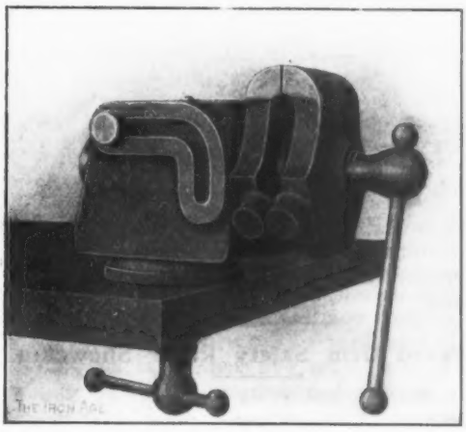


Fig. 1.—The Universal Vise.

metal workers' and jewelers' vise put on the market by the Emmert Mfg. Company, Waynesboro, Pa. The vise is so constructed as to be used in any conceivable

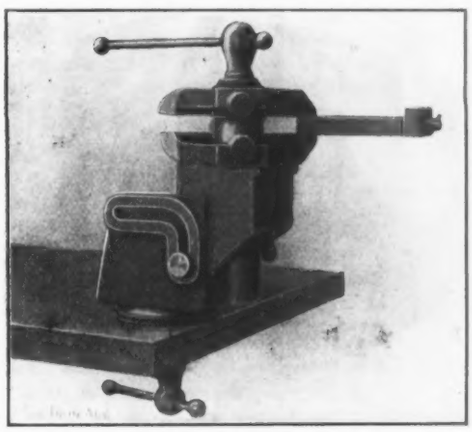


Fig. 2.—Vise in Upright Position.

position. It is supplied with one set of groove jaws to hold all classes of round work, one set of jaws which will hold any class of taper work, one set to hold cop-

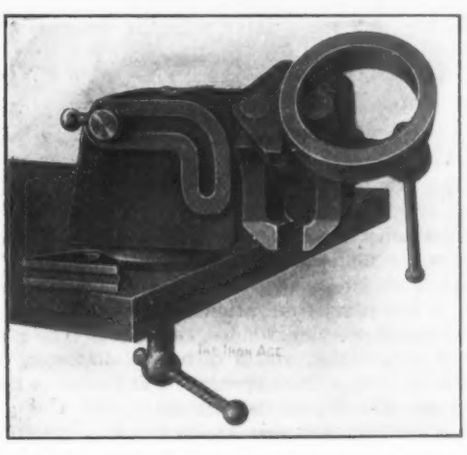


Fig. 3.—Jaw for Holding Rings.

per work, and one set to hold any size of ring. It is also supplied with a rough jaw for cast iron work, with one smooth jaw for finished work and with pipe jaws. All of these, with the exception of the rough and smooth jaws, are made especially to fit on the round projecting

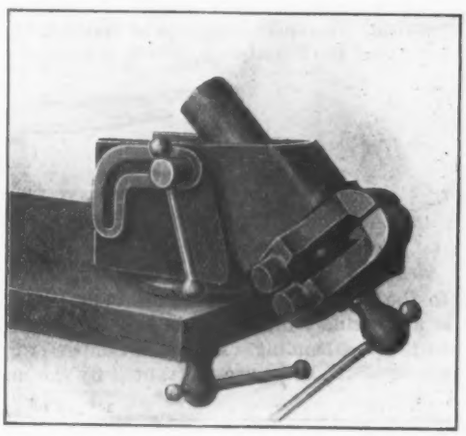


Fig. 4.—The Vise at an Angle.

jaws. The vise is referred to as being universal in every sense of the word.

The Gold Medal Camp Furniture.

The combination cot and litter and the camp stool shown in the accompanying cuts are put on the market by the Gold Medal Camp Furniture Mfg. Company, Racine Junction, Wis. The cot is shown in Fig. 1 adjusted for use, also folded. Its extreme length is 7 feet, the duck part being 6 feet 2 inches. It has two handles on each end and two hand holes on each side. Folded it is 7 feet long by about 4 inches square. It is guaran-

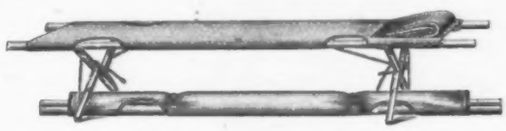


Fig. 1.—Gold Medal Combination Cot and Litter.

teed to support 600 pounds and when adjusted for use as a litter not to close. It is covered with 14-ounce army duck, colored brown or drab. Its weight is 15 pounds. The camp stool, Fig. 2, is made so as to be strong enough to support 300 pounds or more. When folded it is 2 feet long, 2½ inches square and weighs 1½ pounds. The seat is of heavy brown duck, reinforced

Fig. 2.—Racine Camp Stool No. 32.

and tacked at the corners. The legs are fastened to the malleable iron center piece with rivets, each leg resting on two shoulders, one on each side, to prevent splitting or breaking. The company advise us that they have recently doubled their capacity, have put in new boilers and engine and are contemplating making another large addition to their factory.

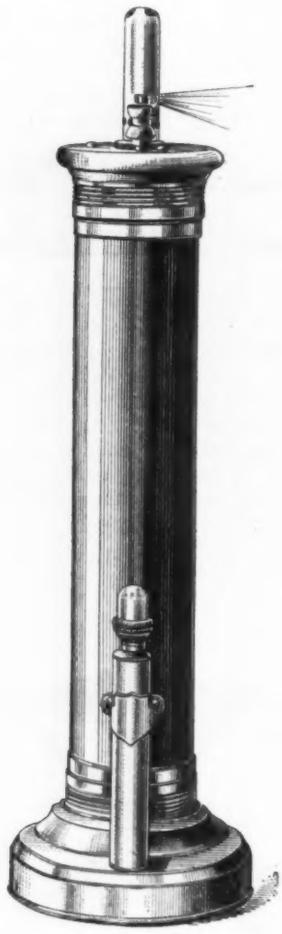
The Regal Hockey Skate.

The Starr Mfg. Company, Halifax, N. S., Canada, are offering for this season the new design of hockey skate shown herewith. The special feature of the skate is the box bracket under the front plate, which is alluded to as superior to the ordinary angle bracket. The front and heel plates are spring tempered to insure extra stiffness and also to prevent bending. A special temper is given to the runners. The skates are warranted by the manufacturers.

The Regal Hockey Skates.

Electrical Portable Cigar Lighter.

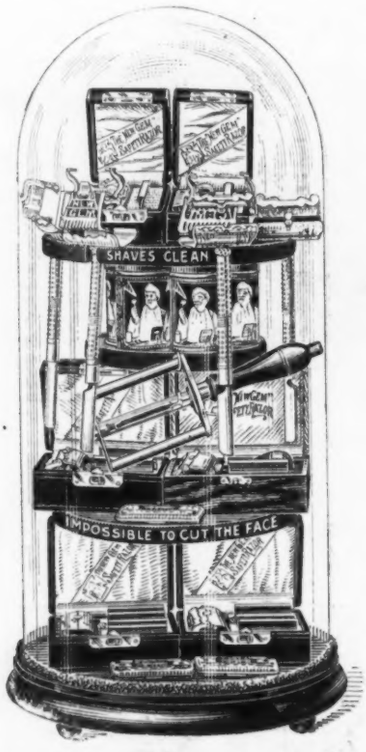
American Electrical Novelty & Mfg. Company, 255 Centre street, New York, have put on the market, supplementing a large line of dry battery electrical novelties, many of which they have made for years, the electrical portable cigar lighter here illustrated. It is designed for desk, card table, smoking or other room. If so desired it can be screwed fast by means of three flat nickeled strips at the base, which have been more recently added. The standard is 10¾ inches high over all, 3¼ inches extreme width at base, and is finely trimmed and finished in polished nickel. The torch, or lighter, is kept in a bath of alcohol, seen in front at bottom. In operation, the wire asbestos tipped torch is removed, pressed lightly on the metal button in front of the burner, at the same time pushed forward so as to contact with a wire coil in the tube above, thus generating a glow in the coil by closing the circuit, and igniting the alcohol in the torch. The interior of the standard contains a removable round dry battery which can be instantly replaced by a fresh battery at a retail cost of 25 cents. A battery is said to give a total of 2000 lights before exhaustion. Aside from the convenience and novelty of this device, the possible damage from fire or disfigured furniture by carelessly scratched matches is greatly reduced and the smoker does not inhale match phosphorus.



Electrical Portable Cigar Lighter.

Improved Gem Safety Razor Showcase.

Gem Cutlery Company, 34 Reade street, New York, have brought out an improved form of showcase in which to display and sell their Gem safety razor, as here shown. This showcase is sent gratuitously to dealers with an order for $20 to $25 worth of their goods, either regular or special assortments selected by the buyer. The base and shelves are ebonized wood, resting on three feet, the base being 9½ inches in diameter and having a groove to receive the circular glass case, thus excluding dust. The upper and lower shelves are 6¾ inches in diameter, the center one being slightly smaller. The shelves are supported by an upright column at the back so as to afford an unobstructed view of the goods exhibited, which consist of various cases of Gem safety razors, stropping machine, blades, cases, &c. The glass itself is 17 inches high and 8 inches in diameter, the whole outfit making a fine appearance, at the same time increasing the salability of its contents.



New Gem Safety Razor Showcase.

S. M. Holtsinger has bought an interest in the Hardware firm of C. E. Baylor & Co., Morristown, Tenn., wholesale and retail dealers in Shelf and Heavy Hardware, Stoves, Tinware, Wooden Ware, &c. The firm have lately put in new shelving and store ladders, and have also built a new office.